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ICONES PLEUROTHALLIDINARUM
XII

SYSTEMATICS
OF
BRACHIONIDIUM

ADDENDA TO DRESSLERELLA, PLATYSTELE AND PORROGLOSSUM

(ORCHIDACEAE)

Missouri Botanical Garden

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(ORCHIDACEAE)

Carlyle A. Luer

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Brachionidium uxorium Luer & Vásquez, Bolivia, Chapare, department of Cochabamba, terrestrial in mossy forest, altitude 2800 meters above sea level, 14 Nov. 1992, photo by Walter Teague.

SYSTEMATICS OF THE GENUS *BRACHIONIDIUM* (ORCHIDACEAE)

ABSTRACT

A history of *Brachionidium* Lindl. is given and the genus is described. A key to the species is given. Each species is described and illustrated with a black and white drawing. A distribution map is included for each species.

New species:
Brachionidium alpestre Luer & Vásquez, sp. nov.
Brachionidium andreettae Luer & Hirtz, sp. nov.
Brachionidium arethusa Luer, sp. nov.
Brachionidium ballatrix Luer & Hirtz, sp. nov.
Brachionidium calypso Luer, sp. nov.
Brachionidium capillare Luer & Hirtz, sp. nov.
Brachionidium dentatum Luer & Dressler, sp. nov.
Brachionidium dodsonii Luer, sp. nov.
Brachionidium dressleri Luer, sp. nov.
Brachionidium ephemerum Luer & Hirtz, sp. nov.
Brachionidium filamentosum Luer & Hirtz, sp. nov.
Brachionidium fornicatum Luer & Hirtz, sp. nov.
Brachionidium furfuraceum Luer, sp. nov.
Brachionidium galeatum Luer & Hirtz, sp. nov.
Brachionidium haberi Luer, sp. nov.
Brachionidium imperiale Luer & Escobar, sp. nov.
Brachionidium jesupiae Luer, sp. nov.
Brachionidium lehmannii Luer, sp. nov.
Brachionidium loxense Luer, sp. nov.
Brachionidium lucanoideum Luer, sp. nov.
Brachionidium minusculum Luer & Dressler, sp. nov.
Brachionidium operosum Luer & Hirtz, sp. nov.
Brachionidium peltarion Luer, sp. nov.
Brachionidium piuntzae Luer, sp. nov.
Brachionidium polypodium Luer, sp. nov.
Brachionidium puraceënse Luer, sp. nov.
Brachionidium renzii Luer, sp. nov.
Brachionidium satyreum Luer, sp. nov.
Brachionidium stellare Luer & Hirtz, sp. nov.
Brachionidium syme-morrisii Luer, sp. nov.
Brachionidium uxorium Luer & Vásquez, sp. nov.
Brachionidium zunagense Luer & Hirtz, sp. nov.

From a collection made by Jean Linden on his trip to New Granada to gather plants for the trade, John Lindley described the first species of this genus in *Restrepia* H.B.K. in 1846. The specific name referred to the comparatively small leaves as compared to those commonly seen in *Restrepia*. In 1859, Lindley erected the genus *Brachionidium* to accommodate this exceptional *Restrepia parvifolia* along with later collections of two other species. The name refers to the pair of tiny "arms" of the stigma that protrude from either side of the anther. The epithet *parvifolium* became a misnomer because the leaves have proved to be some of the largest in the genus. *Brachionidium parvifolium* is one of the most robust and most beautiful, and one of the most frequent and widely distributed species of the genus.

In none of the three original specimens attributed to *Brachionidium* was Lindley able to find and describe the pollinia. The first reported number of pollinia in a species of the genus was six by Rolfe when he described *B. sherringii*, the fourth

species attributed to the genus, from the West Indian isle of Grenada in 1893. Schlechter saw six in the Peruvian *Brachionidium serratum* in 1911. In 1919, Hoehne found eight pollinia in a species from Brazil, and he described it in a new genus, *Yolanda*, because, he thought, *Brachionidium* had only six pollinia. Garay (1956) followed him, declaring that *Brachionidium* was distinguished by six pollinia, and *Yolanda*, by eight pollinia. In the same publication he redescribed the relatively frequent *B. tuberculatum*, a species with eight pollinia, as *B. floribundum*.

Recently, ample fresh material of *B. parvifolium*, the type of the genus, has been examined from several different localities in both Colombia and Ecuador. Eight pollinia are consistently present. The pollinaria from numerous other species have been examined, and either six or eight pollinia are present, there being no correlation with any morphological feature. Therefore, if two numbers of pollinia must be acceptable in *Brachionidium*, two numbers of pollinia could be expected to occur in other pleurothallid genera (i.e. *Pleurothallis: P. ophiocephala* Lindl. and *P. kegellii* Rchb.f.). About 24 species have eight pollinia, and most of these are restricted to South America. *Brachionidium kuhniarum* is the only species known in which two sets of three pollinia are normally joined at the clavate ends.

Today, the genus *Brachionidium* contains 64 known species widely distributed in tropical America. Most of them are local and infrequent in wet, virgin forests. Many grow terrestrially, erect or creeping, in shaded, loose, mossy or leafy litter, but some species trail like a vine in tall trees, and flower only when sufficient light is reached. Some species grow erect in relatively exposed habitats. Other species grow fully exposed terrestrially or in stunted trees of cold paramos over 3000 meters above sea level.

Many plants flower infrequently and the flowers are fragile, often lasting only a day or two. Therefore, to our dismay, plants are too often without flowers when found, and most are difficult or impossible to cultivate. At least two sterile collections of undescribed species are known. Herbaria of the world contain comparatively few collections. Wild plants are either neglected or unrecognized because many collectors are unfamiliar with them. Many of the collections that are made are either sterile or with poorly preserved flowers.

Some of the following illustrations were made from dried flowers removed from herbarium sheets and reconstituted in concentrated ammonium hydroxide. Obviously, far superior drawings can be made from fresh or freshly pickled material, but in some instances, only dried and pressed material has been available. Fresh flowers dried without too much pressure rehydrate very well, while those flowers crushed and dried tightly in a plant press are impossible to resurrect satisfactorily.

The species are too closely related to each other to suggest any subgeneric division. All plants are characterized by sheathed, stemlike, branching rhizomes that may creep, ascend or stand erect, and produce at intervals a short, similarly sheathed aerial stem (the ramicaul) and its leaf. The sheaths are usually long-mucronate and glabrous, but in a few species the sheaths are scurfy with papilliform scales that are often seen along the inferior margins.

The ephemeral flowers are solitary and usually non-resupinate with four free, membranous flower parts: a middle sepal, a synsepal composed of the connate blades of the lateral sepals, a large pair of petals more or less similar to the sepals, plus the lip. The apex or the tip of the tail of the synsepal is entire, shortly bifid, or sometimes split into two filamentous segments.

The lip (Figure 1, page 3; Figure 2, page 11) is small, thick and usually transverse with a central callus, reminiscent of the lip of a *Stelis*. There are four surfaces. The lip is often variable, especially in widely distributed species such as *B. tuberculatum*. The upper or top surface is held beneath the column, with some modifications of a pubescent callus. The front surface is variably sculpted, more or less concave and convex. A shiny, rounded structure, the glenion (commonly seen in *Platystele, Pleurothallis* and *Stelis*), often extends forward from the callus onto the front surface. The back surface is flat or modified by deflection of the base, or claw, to the attachment to the obsolescent column-foot. The sides are more or less triangular in outline. The anterior margin of the lip varies from entire, fringed, or variously callous. A callus often runs parallel to the margin, sometimes with a cavity between the two edges, thereby forming a bimarginate margin. Oxalate crystals are commonly seen as in other pleurothallids.

The column is short and broad with an apical anther and a transverse, apical, bilobulate stigma. The lobes appear to be separate, but beneath the rostellar flap they are contiguous, as they are in *Lepanthopsis, Platystele*, most species of *Pleurothallis* subgen. *Pleurothallis* and most species of *Stelis*. The tips of the stigmatic processes, which prompted the generic name, project forward above the anterior margin of the rostellum beneath the bed of the anther. The anther cap is thin and deciduous. The pollinia are narrowly pyriform or clavate, entirely free or attached to a small viscidium. Sometimes the pollinia vary in size. Sometimes all six or eight pollinia are bound by a single viscid mass, and sometimes two sets of three or four pollinia are bound by viscid masses.

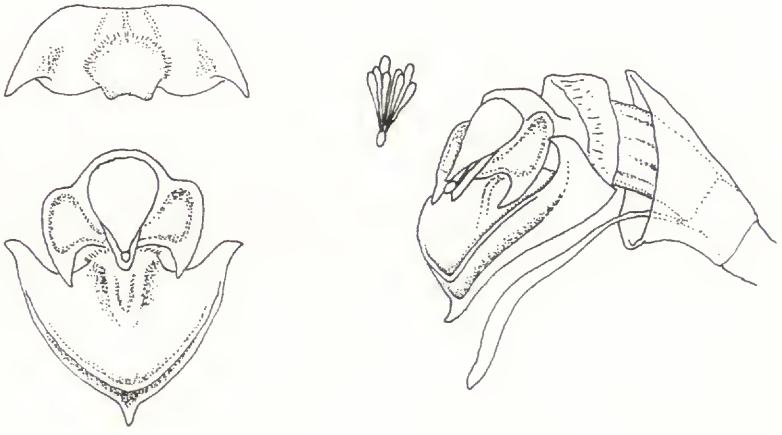

Figure 1.

Upper left: upper surface of non-deflexed lip with callus. Upper right: eight pollinia; oblique view of bimarginate lip, column with bilobed stigma, ovary, and filament from pedicel concealed within floral bract. Lower left: front surfaces of column with intact anther and stigmatic lobes, and lip; the callus with glenion is beneath the rostellum.

Brachionidium Lindl., Folia Orchid. *Brachionidium* 1, 1859.

Ety.: From the Greek *brachium*, "an arm," and the diminutive ending *-idium*, referring to the pair of protruding armlike processes of the rostellum.

Lectotype: *Restrepia parvifolia* Lindl., Orchid. Lind., 4, 1846. [*Brachionidium parvifolium* (Lindl.) Lindl., Folia Orchid. *Brachionidium* 1, 1859] (Garay, Canad. J. Bot. 34: 729, 1956)

Syn.: *Yolanda* Hoehne, Arq. Mus. Nac. Rio de Janeiro 22: 72, 1919.

Type: *Yolanda restrepioides* Hoehne, Arq. Mus. Nac. Rio de Janeiro 22: 72, 1919.
[*Brachionidium restrepioides* (Hoehne) Pabst, Orchid. Brasilienses 166, 1975.

Ety.: Named in honor of Yolanda, daughter of F. C. Hoehne, Brazilian botanist.

Syn.: *Brachionidium* sect. *Yolanda* (Hoehne) Pabst, Bradea 1(24): 269, 1972.

Type: *Yolanda restrepioides* Hoehne, Arq. Mus. Nac. Rio de Janeiro 22: 72, 1919.

Plants perennial, very small to large, weak to robust, epiphytic to terrestrial, the rhizome repent to erect, branching, elongate between aerial stems (ramicauls), enclosed by a few tubular, glabrous to scurfy sheaths, usually mucronate; roots few to many near the base, or singly from nodes on the rhizome, slender to coarse or fleshy. Ramicauls ascending to erect, non-pseudobulbous, shorter than the leaf, unifoliate, usually enclosed by 2 tubular, mucronate, glabrous to scurfy sheaths, the inflorescence emerging laterally without an annular ring (annulus) from near the apex (the leaf-stem abscission layer). **Leaf** erect in relation to the ramicaul, thinly to thickly coriaceous, smooth to rugose-verrucose, green or dark green, sometimes suffused with purple, elliptical to narrowly elliptical, the apex acute to obtuse, shallowly notched with a mucro in the sinus, the base cuneate or narrowly cuneate into a short petiole. **Inflorescence** a solitary, usually non-resupinate flower, borne by a peduncle longer or shorter than the leaf, with a bract near the middle and another near the base; floral bract cucullate, inflated, acuminate, enclosing the abbreviated pedicel and often much of the ovary; pedicel stout, with a filament much longer than the pedicel itself; ovary smooth, trivalvate; **sepals** conspicuous, membranous, variously colored, smooth, often minutely ciliate, the middle sepal essentially free, usually lowermost, acute to obtuse, the apex often acuminate into a slender tail, the lateral sepals connate into an uppermost synsepal, essentially free, acute to obtuse, the apex often acuminate into a slender, sometimes bifid tail; **petals** conspicuous, thin, membranous, similar to the sepals, often minutely ciliate, the apex usually acuminate into a slender tail; **lip** small, fleshy, usually transverse, the apex acute, obtuse to rounded, the margin smooth to fimbriate, sometimes bimarginate, with or without an apiculum, the disc more or less carinate or excavate anteriorly, with a flat, ovoid, more or less pubescent callus in the center above the base that fits under the column in the natural position, the base hinged to the apex of the column-foot; **column** stout, short, semiterete, the anther and rostellum apical, the apical margin of the column bidentate, or smooth, the anther cap deciduous, 2-celled, the pollinia yellow, narrowly clavate-pyriform, more or less granular, 6 or 8, of unequal sizes in 2 packets, often free, or attached to a detachable, viscid viscidium, the stigma apical, transversely bilobed, the receptive surfaces protruding to either side of the rostellar flap, sometimes on short, acute lobes or "arms", the base of the column forming a thick foot with the apex of the ovary.

Contrary to one's first impression, especially because two numbers of pollinia are present, the species are too closely interrelated to define subgeneric categories. The species are first identified in the key by the most obvious, gross morphological features, and lastly by more obscure or microscopic characters. The most obvious dichotomous split seems to be the habit, whether it be erect or creeping, but both habits may occur in some species. Therefore, a few species appear more than once in the key. Similar species appear grouped together in the key. There is no obvious morphological correlation between the number of pollinia and another physical feature. The key is totally artificial.

KEY TO THE SPECIES OF *BRACHIONIDIUM*

1 Habit more or less erect or erect-climbing, the roots mostly produced near the base of the rhizome (if indefinite, try 48) 2
1' Habit scandent, more or less prostrate, repent or climbing, the roots produced singly from nodes along the rhizome (if indefinite, try 2)

Habit erect, sheaths scurfy or with tuberculate margins

2 Sheaths of the rhizome and ramicauls scurfy, or with the margins crenulate or tuberculate 3
2' Sheaths of the rhizome and ramicauls neither scurfy, nor with crenulate or tuberculate margins 10

3 Leaves rugose with verrucose, elevated veins; synsepal cucullate ..... *B. galeatum*
3' Leaves smooth, not rugose 4

4 Synsepal deeply concave, cucullate 5
4' Synsepal concave, not cucullate 7

5 Synsepal with the tail as long as or longer than the blade ..... *B. arethusa*
5' Synsepal with the tail much shorter than the blade 6

6 Leaves 10-14 mm wide; lip much broader than long ..... *B. elegans*
6' Leaves 4-6 mm wide; lip about as broad as long ..... *B. furfuraceum*

7 Sepals more than 3 cm long ..... *B. alpestre*
7' Sepals less than 2 cm long 8

8 Lateral angles of the lip obtuse, but more or less incurved ..... *B. tuberculatum*
8' Lateral angles of the lip acute 9

9 Sepals prominently striped in purple ..... *B. uxorium*
9' Sepals green to purple, not striped ..... *B. cruzae*

Habit erect, sheaths apiculate without epidermal appendages, plants more than 10 centimeters tall

10 Mature plant more than 10 cm tall, the internodes of the rhizome often longer than the ramicauls 11
10' Mature plant less than 10 cm tall, the internodes of the rhizome often shorter than the ramicauls 27

11 Leaves rugose, with verrucose, elevated veins 12
11' Leaves smooth, not rugose 13

12 Sepals and petals minutely ciliate; lip denticulate.....*B. dentatum*
12' Sepals and petals glabrous; lip not denticulate.....*B. rugosum*

13 Leaves suborbicular or broadly elliptical with the apex rounded.....*B. loxense*
13' Leaves elliptical with the apex acute to obtuse.....29

14 Pedicel thrice or more longer than the leaf.....*B. vasquezii*
14' Pedicel shorter to about twice as long as the leaf.....15

15 Peduncle short, not longer than the ramicaul.....*B. dalstroemii*
15' Peduncle nearly as long to about twice as long as the leaf.....16

16 Middle sepal 5- or more veined.....17
16 Middle sepal 3-veined.....19

17 Synsepal deeply concave with the split tail shorter than the blade.....
.....*B. fornicatum*
17' Synsepal not deeply concave, with tails elongate.....18

18 Sepals 5- to 7-veined, with tails more or less equaling the blades in length.....
.....*B. parvifolium*
18' Sepals 11- to 15-veined, with tails much exceeding the blades in length .....
.....*B. imperiale*

19 Synsepal with a slender tail longer than the blade.....20
19' Synsepal tailless or with a tail shorter or as long as the blade.....24

20 Lip with prominent lateral angles.....21
20' Lip without prominent lateral angles.....22

21 Lateral angles broadly rounded with the apex recurved.....*B. calypso*
21' Lateral angles antrorse, narrow and fringed.....*B. lucanoideum*

22 Margin of the lip denticulate.....*B. dressleri*
22' Margin of the lip entire.....23

23 Callus extending down the back surface of the lip.....*B. satyreum*
23' Callus not extending down the back of the lip.....*B. hirtzii*

24 Middle sepal abruptly caudate; lip denticulate.....*B. haberi*
24' Middle sepal acuminate; lip not denticulate.....25

25 Middle sepal acute, synsepal obtuse with a minute, obtuse apiculum...*B. piuntzae*
25' Middle sepal and synsepal acuminate.....26

26 Leaves less than 2 cm long; sepals 6-10 mm long.....*B. tetrapetalum*
26' Leaves more than 3 cm long; sepals ca. 15 mm long.....*B. andreettae*

Habit erect, plants less than 10 cm tall

27 Leaves rugose ..... *B. operosum*
27' Leaves smooth 28

28 Synsepal tailless or shortly acuminate 29
28 Synsepal distinctly caudate, with the tail longer than the blade 35

29 Synsepal narrowly ovate, acute ..... *B. pteroglossum*
29' Synsepal ovate to broadly ovate, obtuse to shortly acuminate 30

30 Lip longer than wide, subcordate-trilobed, ciliate-denticulate 31
30' Lip transverse, broader than long, entire 32

31 Lip sagittate-triangular with basal lobes retrorse ..... *B. brevicaudatum*
31' Lip trilobed with lateral lobes antrorse ..... *B. ciliolatum*

32 Sepals and petals glabrous 33
32' Sepals and petals ciliate 34

33 Pollinia 8 ..... *B. restrepioides*
33' Pollinia 6 ..... *B. neblinense*

34 Synsepal shortly acuminate ..... *B. tetrapetalum*
34' Synsepal obtuse, not acuminate ..... *B. simplex*

35 Sepaline tails shorter than to about as long as the blade 36
35' Sepaline tails twice or more longer than blade 41

36 Middle sepal with the tail less than 10 mm long 37
36' Middle sepal with the tail more than 12 mm long 38

37 Sepals and petals glabrous; lip acutely deflexed near the middle with a broad claw ..... *B. peltarion*
37' Sepals and petals minutely ciliate; lip flat, not deflexed ..... *B. parvum*

38 Sepals and petals glabrous ..... *B. portillae*
38' Sepals and petals minutely ciliate 39

39 Lip with a broad callus extending down the reflexed back of the lip ..... *B. longicaudatum*
39' Lip with a small, central callus 40

40 Lip distinctly bimarginate ..... *B. stellare*
40' Lip smooth to convex within the margins ..... *B. kuhniarum*

41 Lip with the margin denticulate 42
41' Lip entire, not denticulate 45

42 Peduncle about three times as long as the leaf; sepals with tails less than 20 mm long ..... *B. lehmannii*
42' Peduncle shorter to about as long as the leaf.....43

43 Plant less than 2 cm tall; sepals with tails ca. 12 mm long.....*B. julianii*
43' Plant 4-7 cm tall; sepals with tails more than 25 mm long.....44

44 Lip geniculate, with the base deflexed from near the middle, with the margin denticulate ..... *B. folsomii*
44 Lip flat with the base shortly deflexed, with the margin minutely undulate..... ..... *B. renzii*

45 Lip broadly ovate with a simple margin.....*B. dodsonii*
45' Lip transverse, broadly obtuse, bimarginate.....46

46 Lip with narrow, acute lateral angles.....*B. syme-morrisii*
46' Lip with obtuse lateral angles 47

47 Peduncles 3-5 cm long; synsepal shallowly concave.....*B. sherringii*
47' Peduncles less tha 3 cm long; synsepal deeply concave.....*B. ballatrix*

Habit repent

48 Leaves elliptical to suborbicular, less than 15 mm long.....49
48' Leaves elliptical to narrowly elliptical, more than 15 mm long.....60

49 Petals sharply saw-toothed.....*B. serratum*
(*B. serratum* is placed here because too few details are known to compare elsewhere.)
49' Petals not sharply serrate.....50

50 Rhizome between ramicauls often as long as or longer than the leaves.....51
50' Rhizome between ramicauls mostly shorter than the leaves.....55

51 Peduncles about as long as the leaves; sepals less than 7 mm long.....52
51' Peduncles longer than the leaves; sepals 13-15 mm long.....54

52 Petals eciliate; lip with broad, antrorse, lateral angles.....*B. minusculum*
52' Petals ciliate 53

53 Lip with acute, narrowly triangular, lateral angles.....*B. pusillum*
53' Lip with obtuse lateral angles.....*B. brachycladium*

54 Leaves suborbicular; lip with simple margin, long-apiculate.....*B. capillare*
54' Leaves elliptical; lip bimarginate, minutely apiculate.....*B. jesupiae*

55 Sepals broadly ovate, shortly acuminate without tails.....*B. escobarii*
55' Sepals long-acuminate with slender tails 56

56 Sepaline tails about as long as the blade; lip transverse.....57
56' Sepaline tails much exceeding the blades in length; lip ovate-triangular.....58

57 Rhizome slender; leaves narrowly elliptical.....*B. ephemerum*
57' Rhizome stout; leaves broadly elliptical.....*B. polypodium*

58 Lip with the margin cellular pubescent.....*B. zunagense*
58' Lip with glabrous margins 59

59 Leaves 8-10 mm long; sepals 10 mm long.....*B. muscosum*
59' Leaves 5-6 mm long; sepals 18 mm long.....*B. filamentosum*

60 Lip with the margin fimbriate.....*B. valerioi*
60' Lip without fimbriate margins 61

61 Sepals acute to acuminate, without slender tails.....62
61' Sepals contracted into slender tails longer than the blade.....66

62 Rhizome between ramicauls often as long as or longer than the leaves .....
.....*B. puraceënse*
62' Rhizome between ramicauls mostly shorter than the leaves.....63

63 Synsepal obtuse.....*B. simplex*
63 Synsepal acute to acuminate.....64

64 Petals glabrous.....*B. meridense*
64' Petals ciliate 65

65 Synsepal slender; lip sharply bimarginate.....*B. ecuadorense*
65' Synsepal stout; lip not sharply bimarginate.....*B. andreettae*

66 Peduncle 2 to 3 times as long as the leaf.....*B. sherringii*
66' Peduncle no longer than the leaf 67

67 Leaves narrow, 4-6 mm wide; sepals ca. 30 mm long including the tails .....
.....*B. diaphanum*
67' Leaves broad, usually 1-2 cm wide; sepals 20-25 mm long including tails.....68

68 Synsepal with the tail entire; lip evenly bimarginate.....*B. hirtzii*
68' Synsepal with the tail bifid; lip bimarginate with the upper margin overhanging the lower margin.....*B. phalangiferum*

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Brachionidium pteroglossum Luer .....Plate 46.
Brachionidium puraceënse Luer .....Plate 47.
Brachionidium pusillum Ames & Schweinf. .....Plate 48.
Brachionidium renzii Luer .....Plate 49.
Brachionidium restrepioides (Hoehne) Pabst .....Plate 50.
Brachionidium rugosum Luer & Hirtz .....Plate 51.
Brachionidium satyreum Luer .....Plate 52.
Brachionidium serratum Schltr .....Page 114.
Brachionidium sherringii Rolfe .....Plate 53.
Brachionidium simplex Garay .....Plate 54.
Brachionidium stellare Luer & Hirtz .....Plate 55.
Brachionidium steyermarkii Foldats = **Brachionidium tuberculatum**
Brachionidium syme-morrisii Luer .....Plate 56.
Brachionidium tetrapetalum (Lehm. & Krzl.) Schltr .....Plate 57.
Brachionidium tuberculatum Lindl .....Plates 58., 59.
Brachionidium uxorium Luer & Vásquez .....Plate 60.
Brachionidium valerioi Ames & Schweinf. .....Plate 61.
Brachionidium vasquezii Luer .....Plate 62.
Brachionidium zunagense Luer & Hirtz .....Plate 63.

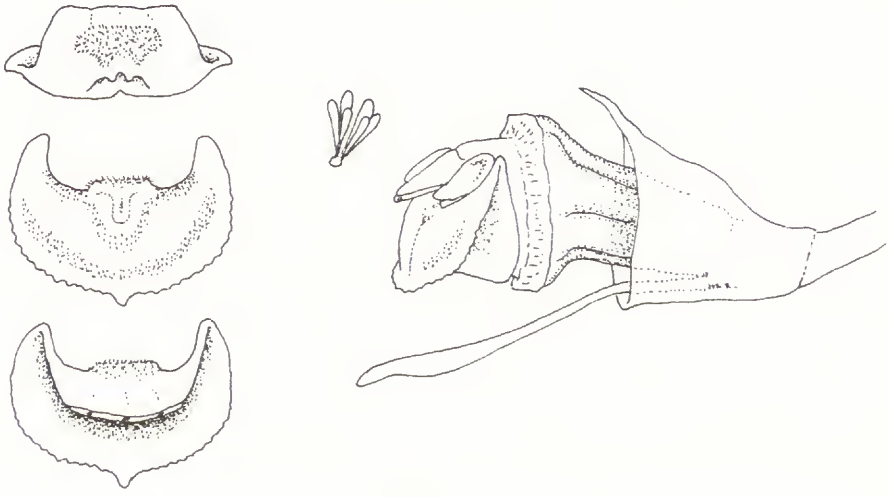


Figure 2.

Upper left: upper surface of deflexed lip with callus. Center left: front surface of single-margined lip; the central callus with glenion are present. Lower left: back surface of lip with deflexed base. Right: six pollinia; oblique view of lip, column with bilobed stigma, ovary, and filament from pedicel concealed within floral bract.

Brachionidium alpestre Luer & Vásquez, sp. nov.

Ety.: From the Latin *alpestris*, "of high altitude," referring to the area of the habitat.

Planta grandis erecta rhizomate crasso vaginis furfuraceis, flore grandi pulcherrimo, sepalo mediano synsepaloque ovatis acuminatis undulatis minutissime ciliatis, sepalo mediano tri-nervis et labello crasso late trapeziformi calloso obtuso.

Plant large, epiphytic to terrestrial, erect, up to 25 cm tall, the rhizome stout, occasionally branching, 2-4 cm long between ramicauls, enclosed by 3 scurfy, tubular sheaths, mucronate at the apex and fimbriate along the lower margin; roots coarse from the base. Ramicauls stout, suberect, 10-12 mm long, enclosed by 2 scurfy, tubular sheaths. **Leaf** suberect, coriaceous, denticulate above the middle, suffused with purple, elliptical, acute, 2.5-3 cm long including a petiole 2-3 mm long, 1-1.2 cm wide, longitudinally 7-veined. **Inflorescence** a solitary, showy, non-resupinate flower borne by a slender, erect peduncle 3.5-5 cm long, with a loose bract near the middle, and another at the base, from near the apex of the ramicaul; floral bract inflated, acute, verrucose, 7 mm long, enclosing the pedicel and ovary; pedicel 1 mm long, with a filament 5-6 mm long; ovary 2 mm long; **sepals** yellow, minutely ciliate, the middle sepal ovate, acute, acuminate, 35 mm long, 10 mm wide, 3-veined, the lateral sepals totally connate into an ovate, acute, acuminate, concave synsepal, 40 mm long, 20 mm wide expanded, 4-veined; **petals** yellow to red-brown, minutely ciliate, ovate, oblique, acute, acuminate, 37 mm long, 9 mm wide, 3-veined; **lip** purple, transversely trapeziform, 3.5 mm long, 6 mm wide, the lateral angles obtuse, erect, the apical margin broadly thickened, broadly rounded, shallowly retuse-apiculate, the disc with a transversely ovoid, shortly pubescent callus 1 mm wide, with a glenion; **column** stout, 1 mm long, pollinia 8.

BOLIVIA: Dept. of La Paz: Prov. of Nor Yungas, terrestrial on the road-cut west of Chuspipata, alt. 3100 m, 21 Jan. 1988, *C. Luer, J. Luer, R. Vásquez & J. Solomon 12888* (Holotype: MO; Isotype: LPB); terrestrial east of the pass, alt. 2770 m, 21 Jan. 1988, *C. Luer, J. Luer, R. Vásquez & C. Luer, J. Luer, R. Vásquez & J. Solomon 12914* (MO); terrestrial northeast of Chuspipata, alt. 2450 m, 29 Jan. 1984, *A. Gentry & J. Solomon 44796* (MO, LPB).

This handsome species grows either epiphytically in low shrubs or terrestrially on road embankments on both sides of a high, cold and wet mountain pass in the Nor Yungas of Bolivia, where it is apparently endemic. The first known collection was made in 1984 by Al Gentry and James Solomon.

Brachionidium alpestre is most similar to the Ecuadorian *B. elegans*, from which it is distinguished by the large, verrucose floral bract; a long-acuminate, flat synsepal; petals held downward against the middle sepal; and the broad, obtuse lip. The sheaths of the stout, erect, rhizomes and ramicauls of both species are scurfy, that is, the surfaces are covered with minute, irregular, cellular appendages. Both species are also similar to the Colombian *B. parvifolium* which has smooth sheaths, but from which they are also easily distinguished by the 3-veined middle sepal and 4-veined synsepal, instead of 5- to 7-veined and 8- or more-veined. All three of the above species possess eight pollinia.

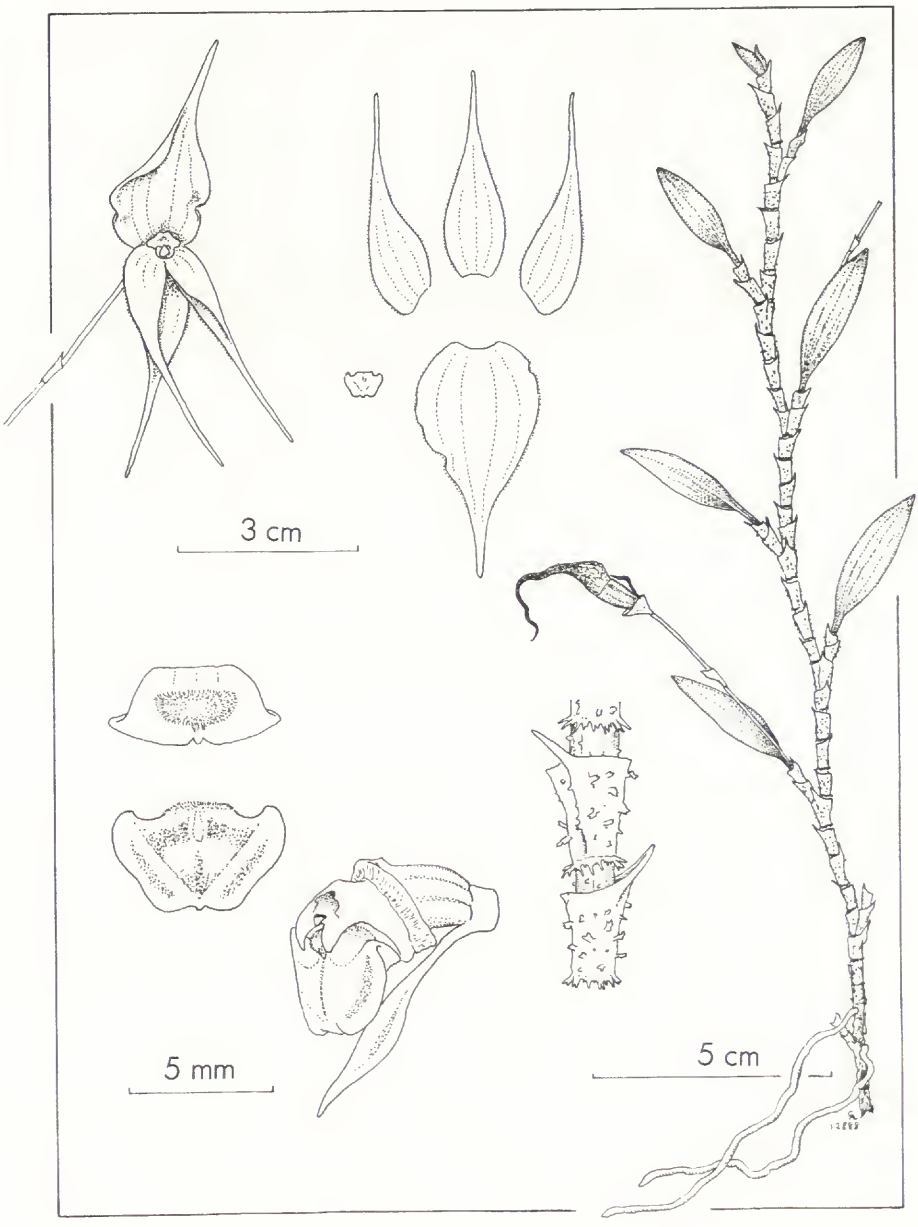


Plate 1. *Brachionidium alpestre* Luer & Vásquez

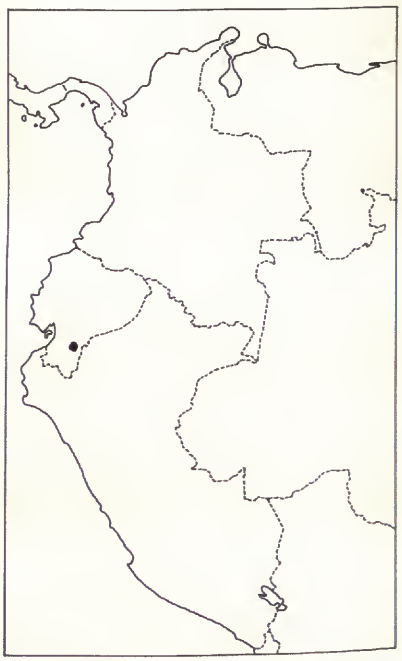
Brachionidium andreettae Luer & Hirtz, sp. nov.

Ety.: Named in honor of Padre Angel Andreetta presently of Paute, Ecuador, one of the original collectors of this species.

Planta grandis erecta vel ascendens rhizomate crasso, flore mediocri pulcherrimo, sepalis ovatis acuminatis minute ciliatis, sepalo mediano tri-nervis, synsepalo concavo et labello crasso late trapeziformi calloso obtuso.

Plant medium in size to large, epiphytic, erect or suberect, up to 15 cm tall, the rhizome stout, occasionally branching, 1-2 cm long between ramicauls, enclosed by 3 non-scurfy, tubular sheaths, mucronate at the apex; roots coarse, from along the rhizome and near the base. Ramicauls suberect, 6-9 mm long, enclosed by 2 tubular sheaths. **Leaf** suberect, coriaceous, elliptical, acute, 2.5-4 cm long including a petiole 2-4 mm long, 7-11 mm wide, 7-veined, cuneate below into the petiole. **Inflorescence** a solitary, showy, non-resupinate flower borne by a slender, erect peduncle 2 cm long, with a loose bract near the middle and near the base, from near the apex of the ramicaul; floral bract inflated, mucronate, 3-4 mm long, enclosing the pedicel and ovary; pedicel 0.5 mm long, with a filament 4-5 mm long; ovary 2.5 mm long; **sepals** translucent, shortly ciliate, the middle sepal light green, ovate, acute, acuminate, 15 mm long, 7 mm wide, 3-veined, the lateral sepals totally connate into a bright purple, ovate, acute, concave synsepal, 15 mm long, 7 mm wide expanded, 4-veined; **petals** purple, short-ciliate, ovate, oblique, acute, acuminate, 14 mm long, 4.5 mm wide, 3-veined; **lip** dark purple, transversely ovate-lunate, 2.5 mm long, 4.5 mm wide, the lateral angles acute, incurved, the apical margin broadly rounded, with a short apiculum, callous below the margins, the disc with a transversely ovoid, pubescent callus 1.5 wide, cleft anteriorly; **column** stout, 1 mm long; pollinia 8.

ECUADOR: Prov. of Zamora-Chinchipe: epiphytic in scrub cloud forest east of the pass east of Loja, alt. 2250 m, 22 May 1988, *C. Luer, A. Hirtz, W. Flores, A. Andreetta & W. Teague 13607* (Holotype: MO; Isotype: QCNE); same area, alt 2300 m, 21 Jan. 1992, *C. Luer, J. Luer, P. Jesup, A. Jesup & A. Hirtz 16091* (MO); same area, alt. 2300 m, *S. Dalström, T. Höijer & H. Wanntorp 1869* (MO).



This relatively large, pretty species is apparently endemic in the mountains of southeastern Ecuador. It is characterized by an ascending, stout habit, smooth, non-scurfy sheaths, and minutely ciliate, acuminate sepals and petals. The lip is not sharply bimarginate.

Brachionidium andreettae is similar to the sympatric, repent *B. ecuadorense*, but *B. andreettae* is distinguished by the stouter rhizome and larger flowers. It is also related to the Colombian *B. parvifolium* from which it is distinguished by the 3-veined middle sepal and the 4-veined synsepal, both of which are merely acuminate instead of caudate. The lip is not sharply bimarginate as it is in *B. ecuadorense* and *B. parvifolium*. All three of the above species possess eight pollinia.

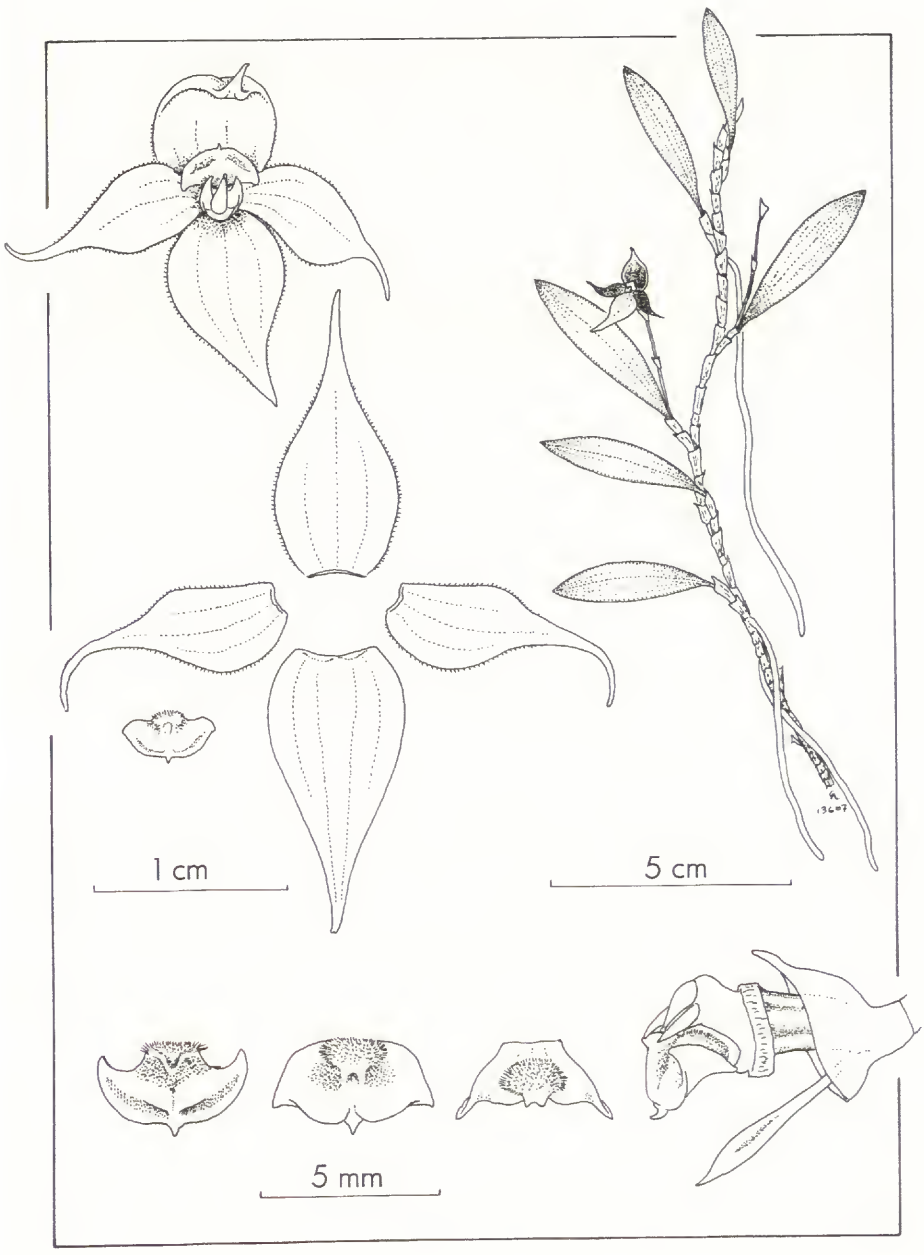


Plate 2. *Brachionidium andreettae* Luer & Hirtz

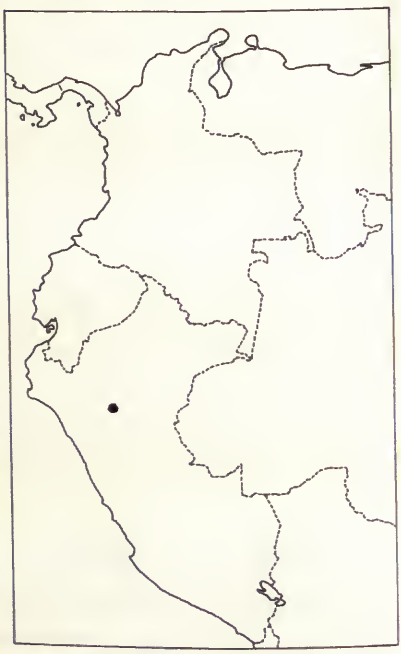
Brachionidium arethusa Luer, sp. nov.

Ety.: Named for Arethusa, a beautiful wood nymph of Greek mythology, who was turned into a stream.

Planta mediocris suberecta rhizomate crasso vaginis furfuraceis, foliis anguste ovatis, 9- ad 13-nervatis, flore grandi, sepalis minute ciliatis longicaudatis, synsepalo concavo quam sepalo mediano multimajore 6-nervato, petalis obliquis sepalo mediano similibus, labello transverse triangulari obtuso, lobis lateralibus acutis, marginibus crassis acute reflexis, callo basali late suborbiculari pubescenti.

Plant medium in size, terrestrial, suberect, up to 15 cm tall, the rhizome relatively stout, occasionally branching, 15-18 mm long between ramicauls, enclosed by 3 tubular, mucronate, scurfy sheaths; roots coarse, from near the base. Ramicauls slender, erect, 7-8 mm long, enclosed by 2 tubular, scurfy sheaths. **Leaf** erect, coriaceous, narrowly ovate, acute with a prominent apiculum, 25-32 mm long, cuneate below into a petiole 2-3 mm long, 8-10 mm wide, 9- to 13-veined. **Inflorescence** a solitary, non-resupinate flower borne by a slender, erect peduncle 3.5-4.5 cm long, with a bract near the middle, from near the apex of the ramicaul; floral bract inflated, acute, 5 mm long, enclosing the pedicel and part of the ovary; pedicel 1 mm long, with a filament 6 mm long; ovary 3.5 mm long; **sepals** translucent green, minutely ciliate, the middle sepal elliptical, acute, attenuate, 34 mm long, the blade 15 mm long, 7 mm wide, 3-veined, contracted into a filiform tail, 16 mm long, the lateral sepals connate into a broadly ovate, acute, attenuate, deeply concave synsepal, 35 mm long, the blade 15-20 mm long, 13 mm wide unexpanded, 6-veined, the apex acuminate into a slender tail ca. 20 mm long, the tips free for 5 mm; **petals** translucent purple, minutely ciliate, ovate, oblique, acute, acuminate, 35 mm long, the blade 15 mm long, 6 mm wide, 3-veined, the tail 20 mm long, the tip free for 5 mm; **lip** purple, transversely triangular, obtuse, 2 mm long, 4 mm wide, the lateral angles acute, incurved, the margins thick and acutely decurved onto the back surface, the disc with a rounded, pubescent callus; **column** stout, 1 mm long; pollinia 8.

PERU: Dept. of San Martin: Dist. Huallaga, valley of Río Apisoncho, 30 Km above Jucusbamba, terrestrial in bamboo thickets near the river, alt. 2800 m, 3 Aug. 1965, *A. C. Hamilton & P. M. Holligan 1095* (Holotype: K), C. Luer illustr. 14707.



This species, apparently endemic in north-central Peru, was collected in a bamboo thicket by the Río Apisoncho during the Cambridge Botanical Expedition in 1965. No subsequent collection is known.

Brachionidium arethusa is distinguished by the scurfy cauline sheaths; erect, multiveined, narrowly ovate leaves; large, long-tailed flowers with a concave synsepal much larger than the three-veined middle sepal; and a transverse, obtuse lip with thick margins reflexed onto the back surface, but the reflection may be an artifact from rehydration.

Brachionidium arethusa is most similar to the Ecuadorian *B. elegans*, from which it is distinguished by the long, sepaline tails. Both species possess eight pollinia.

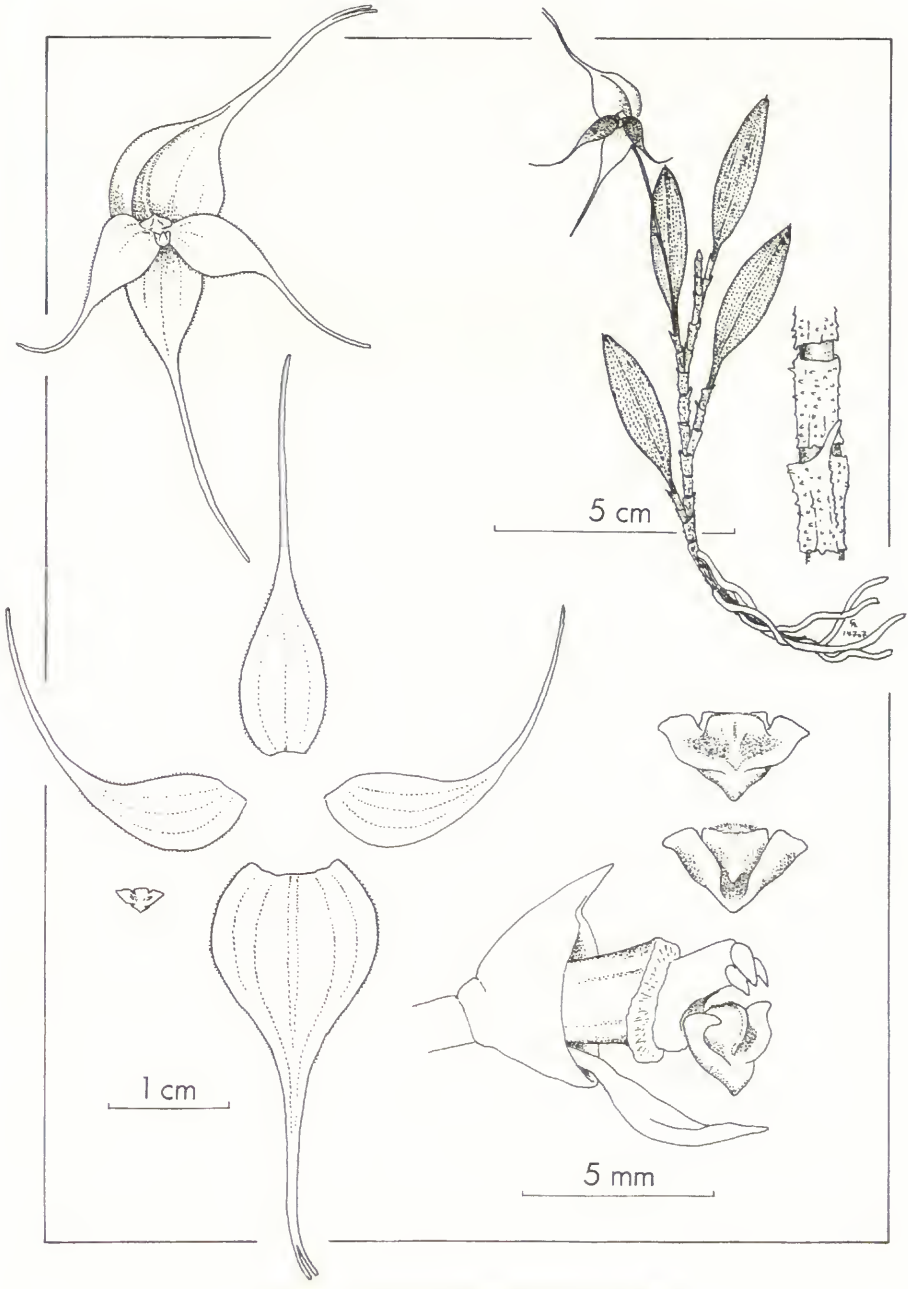


Plate 3. *Brachionidium arethusa* Luer

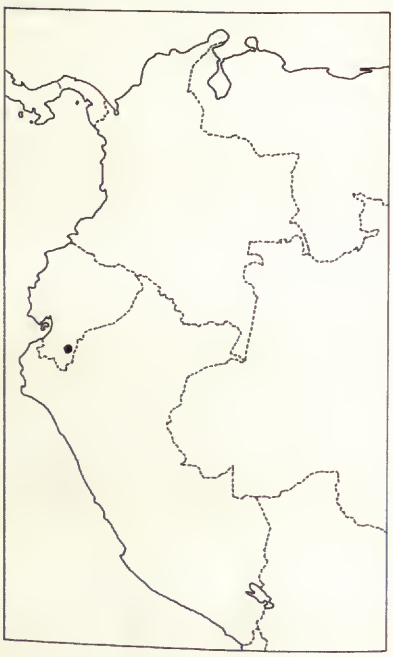
Brachionidium ballatrix Luer & Hirtz, sp. nov.

Ety.: From the Latin *ballatrix*, "a ballet dancer," referring to the graceful appearance of the flower.

Planta parva rhizomate crasso erecto vel suberecto, pedunculo gracili folio elliptico longiore, sepalo mediano synsepaloque flavis eciliatis longicaudatis, synsepalo concavo, suborbiculato, petalis ciliatis ovatis obliquis acuminatis longicaudatis, labello transverse ovato, angulis lateralibus breviter uncinatis, apice rotundato calloso minute apiculato, disco cum callo ovoideo pubescenti centrali.

Plant small, terrestrial, suberect to erect, up to 8 cm tall, the rhizomes stout, branching, 3-5 mm long between ramicauls, enclosed by 3 imbricating, long-mucronate sheaths; roots slender from nodes near the base. Ramicauls suberect, 3-5 mm long, enclosed by 2 mucronate sheaths. **Leaf** erect to suberect, thinly coriaceous, elliptical, acute, apiculate, 15-30 mm long including the petiole 2-3 mm long, 6-12 mm wide, 7-veined, cuneate below into the petiole. **Inflorescence** a solitary, yellow, resupinate flower borne by an erect, slender peduncle 25-30 mm long, with a mucronate bract near the middle and another near the base; floral bract long-mucronate, 6 mm long, enclosing the pedicel and much of the ovary; pedicel 0.5 mm long, with a protruding filament 5-6 mm long; ovary 3 mm long; **sepals** eciliate, the middle sepal elliptical, acute, acuminate, long-caudate, 25 mm long including the tail 14 mm long, 7 mm wide, 3-veined, the lateral sepals connate into a broadly ovate-suborbicular, concave synsepal, 23 mm long including the tail 13 mm long, 8 mm wide expanded, 4-veined; **petals** ovate, oblique, subacute, long-acuminate, minutely ciliate, 23 mm long including the tail 14 mm long, 6 mm wide, 3-veined; **lip** transversely ovate, 1.75 mm long, 2.5 mm wide, with acute, minutely uncinate lateral angles, the apex rounded, marginally callous, minutely apiculate, the disc with a flat, minutely pubescent, ovoid callus with a small glenion, the base hinged to the column-foot; **column** stout, 1 mm long, bidentate; pollinia 6.

ECUADOR: Prov. of Zamora-Chinchipe: terrestrial in cloud forest near Nambija, alt. 1300 m, Feb. 1987, *A. Hirtz 3314* (Holotype: MO), C. Luer illustr. 14369.



This little species is known only from the original collection by Alexander Hirtz near the gold-mining community of Nambija in the Cordillera del Condor in southeastern Ecuador. It is a small, erect species characterized by broadly ovate sepals and petals abruptly contracted into slender tails. The sepals are eciliate; the petals are minutely ciliate; and the lip is bimarginate.

In habit, it is similar to the Central American *B. folsomii*, from which it is distinguished by the non-denticulate, bimarginate lip. It is also reminiscent of *B. sherringii* from the Lesser Antilles, from which it is distinguished by shorter peduncles and broader floral parts with a more deeply concave dorsal sepal.

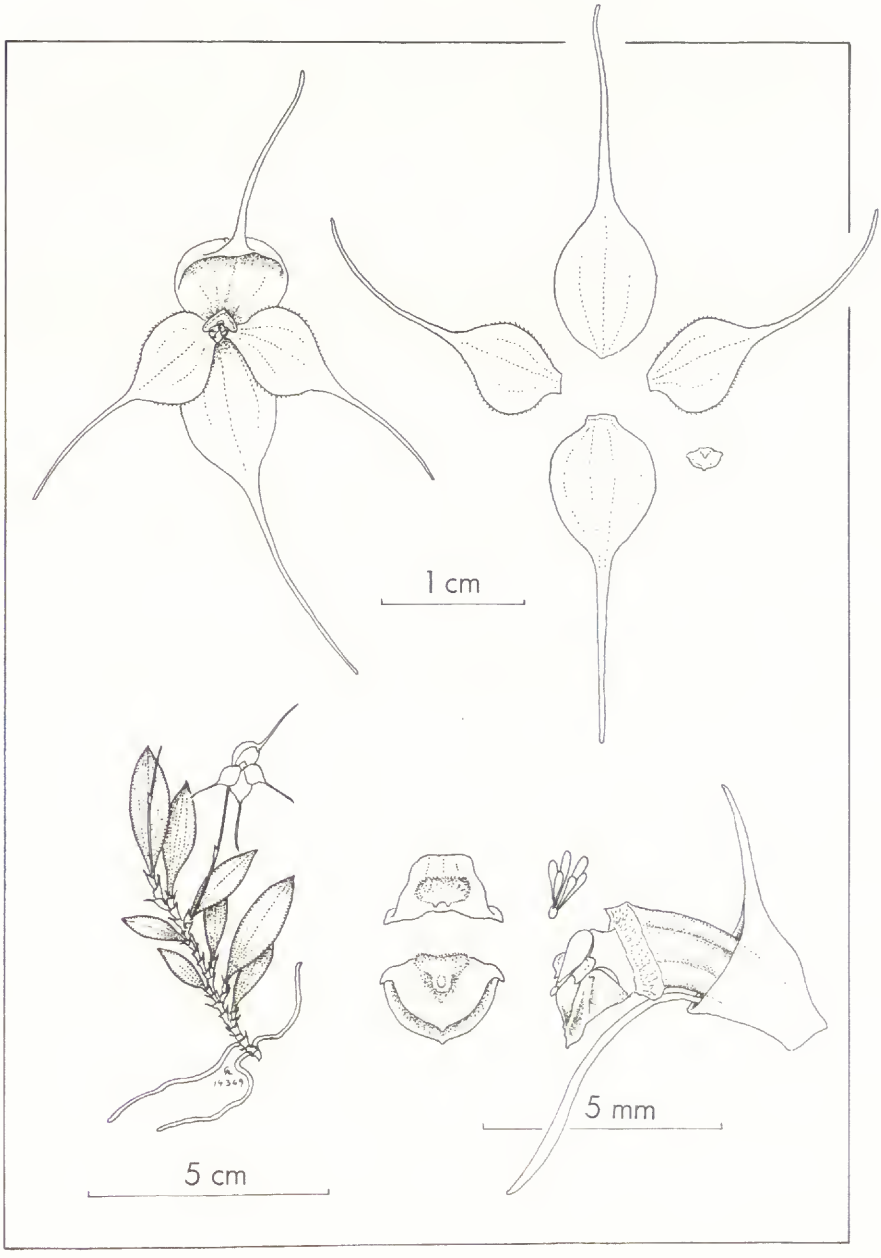


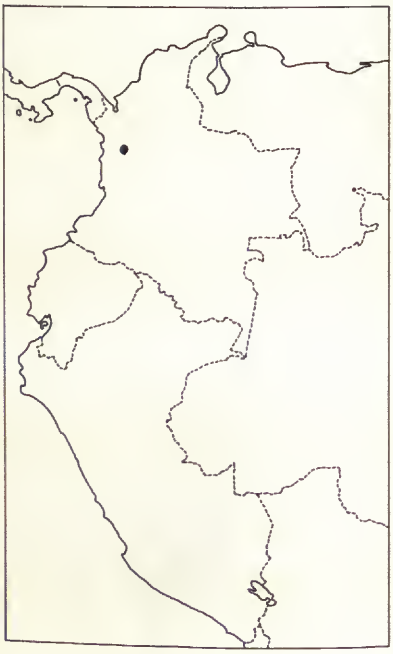
Plate 4. *Brachionidium ballatrix* Luer & Hirtz

Brachionidium brachycladum Luer & Escobar, Orquideología 16: 34, 1986.

Ety.: Named for the similarity of the habit to that of Reichenbach's section *Brachycladae* of *Lepanthes*. From the Greek *brachyclados*, "a short branch," referring to the abbreviated ramicauls.

Plant very small, epiphytic in loose moss, the rhizome comparatively stout, prostrate, long-repent, branching, up to 10-15 cm long, 3-5 mm long between ramicauls, enclosed by 3 imbricating, long-mucronate sheaths; roots comparatively coarse, produced singly from nodes. Ramicauls suberect, 1 mm long, enclosed by 2 similar sheaths. **Leaf** suberect to spreading, coriaceous, broadly elliptical to round, 4-6 mm long, 3.5-5 mm wide, 3-veined, the apex and base obtuse to rounded, the petiole 1 mm long. **Inflorescence** a single, non-resupinate, transparent, white flower borne by a slender, erect peduncle 5-6 mm long, with a thin bract near the middle and at the base; floral bract inflated, acuminate, 1.5-2 mm long enclosing the pedicel and ovary; pedicel 0.25 mm long, with a filament 2 mm long; **sepals** sparsely short-ciliate, translucent, the middle sepal broadly ovate, acute, acuminate, long-caudate, 4.75 mm long including the tail 2 mm long, 1.75 mm wide, 3-veined, the lateral sepals connate into a triangular, acute, long-acuminate lamina 4.5 mm long, 1.75 mm wide, 2-veined, the apices of the tails free for about 0.5 mm, eciliate; **petals** shortly ciliate, ovate, acute, acuminate, caudate, 4.75 mm long including the tail 2 mm long, 1.25 mm wide, 3-veined; **lip** transversely trapeziform, 1 mm long, 1.75 mm wide, the lateral angles obtuse, incurved, the apex subacute to obtuse, the margins callous, the disc with an indistinctly bilobed, pubescent callus; **column** stout, 0.75 mm long; pollinia 6.

COLOMBIA: Dept. of Antioquia: Munic. of Frontino, cloud forest at Alto de Cuevas, alt. 2050 m, 4 Mar. 1983, *C. Luer, J. Luer, R. Escobar, A. Pridgeon & E. Valencia 8946* (Holotype: SEL).



Large masses of intertwined rhizomes of this little species grow among mosses mixed with the leaf-litter on the forest floor. Vegetatively the tiny, branching, multi-sheathed rhizomes appear similar to the repent, or hanging, rhizomes of the group of *Lepanthes* first segregated by Reichenbach into section *Brachycladae*.

Brachionidium brachycladum, apparently endemic in the Western Cordillera of Colombia is characterized by tiny, round leaves with somewhat larger flowers. The sepals and petals are acuminate into tails about as long as the blades. The lip is transverse with a horseshoe-shaped callus. It seems most similar to the Central American *B. pusillum*, but the former is distinguished by the round leaves, thicker rhizome, and the lip with obtuse instead of acute lateral angles.

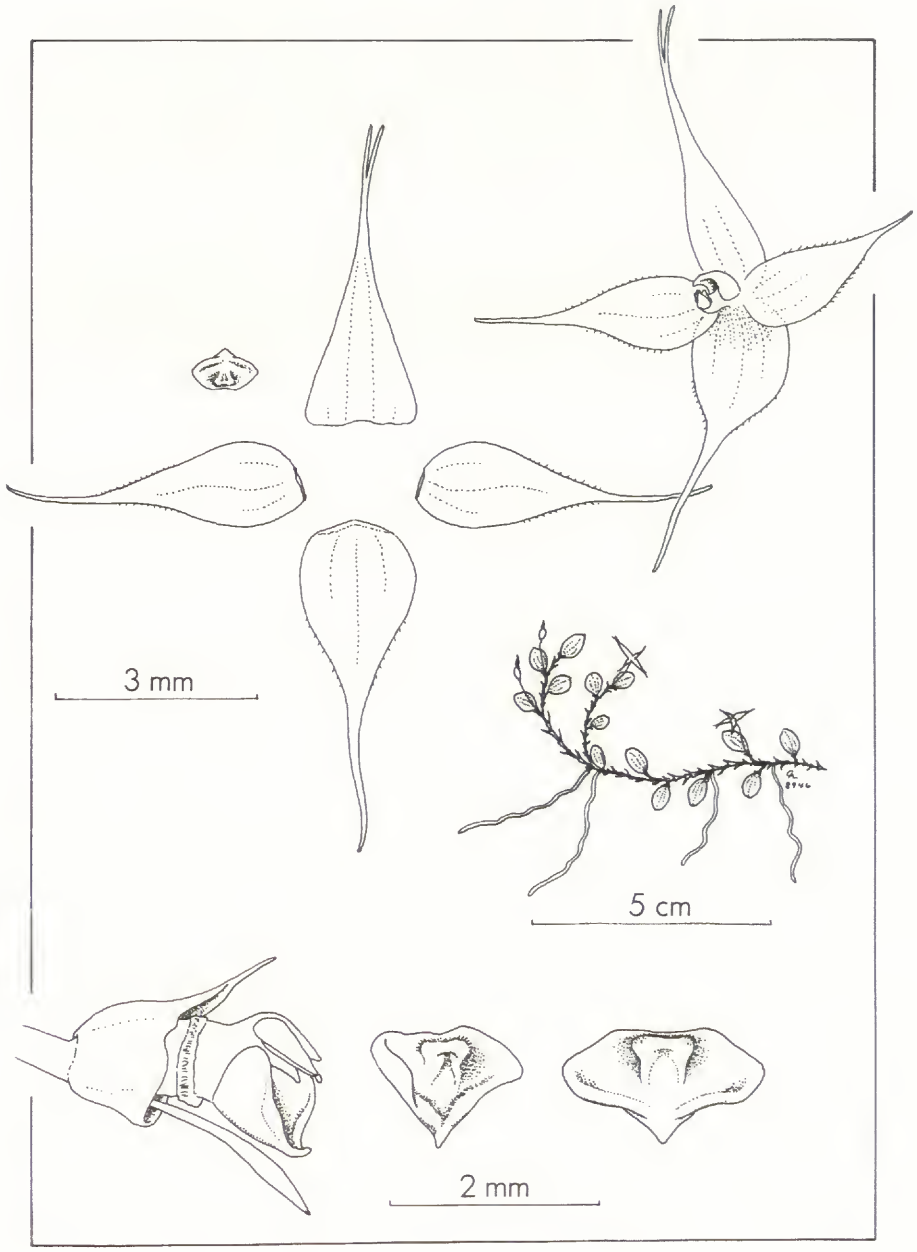


Plate 5. *Brachionidium brachycladum* Luer & Escobar

Brachionidium brevicaudatum Rolfe, Trans. Linn. Soc., ser. 2, 6: 59, 1901.

Ety.: From the Latin *brevicaudatus*, "short-tailed," referring to the apices of the sepals.

Plant small, epiphytic to terrestrial, suberect to erect, up to 10 cm tall, the rhizome stout, occasionally branching, 1-3 mm long between ramicauls, enclosed by 2 imbricating, mucronate sheaths; roots coarse, from nodes near the base of the rhizome. Ramicauls erect to suberect, 3-5 mm long, enclosed by 2 mucronate sheaths. **Leaf** erect to suberect, thinly coriaceous, elliptical, acute, apiculate, 15-30 mm long including the petiole 3-4 mm long, 5-9 mm wide, 7-veined, cuneate below into the petiole. **Inflorescence** a solitary, "pale, brownish pink," or salmon-colored, non-resupinate flower borne by an erect, slender peduncle 20-30 mm long, with a thin bract near the middle; floral bract mucronate, 2-3 mm long, enclosing the pedicel and much of the ovary; pedicel 0.5 mm long, with a protruding filament 3-5 mm long; ovary 1-2 mm long; **sepals** eciliate, the middle sepal broadly ovate, subacute or obtuse, lightly acuminate, 6-10 mm long, 5-7 mm wide, 3-veined, the lateral sepals connate into a broadly ovate, obtuse, lightly acuminate synsepal, 6-10 mm long, 5-7.5 mm wide, 4-veined; **petals** ovate, slightly oblique, subacute to obtuse, shortly acuminate, minutely ciliate, 6-8 mm long, 4.5-5 mm wide, 3-veined; **lip** sagittate-triangular, ciliate, 4 mm long, 3 mm wide, with narrowly obtuse, incurved, basal angles, the apex also narrowly obtuse, the disc with a flat, minutely pubescent, ovoid callus, the base hinged to the column-foot; **column** stout, 1 mm long and broad, bidentate; pollinia 6.

GUYANA: Mt. Roraima, alt. 3500 ft., Autumn 1898, *F. V. McConnell & J. J. Quelch 705* (Holotype: K); C. Luer illustr. 14461; Upper Mazaruni River region, Karowtipu Mountain, alt. ca. 1000 m, 20 Apr. 1987, *B. Boom & D. Gopaul 7538* (NY); Cuyuni-Mazaruni Region, Pakaraima Mts., Kurupung-Membaru trail, in fruit, alt. 650 m, 23 July 1992, *B. Hoffman & G. Marco 2152* (NY, US). (last could be *parvum*)
VENEZUELA: Edo. de Bolívar: Sororopan-tepui, on ridge just below summit, alt. 2225-2255 m, 13 Nov. 1944, *J. A. Steyermark 60047* (AMES, F, NY); between El Dorado and Sta. Elena de Uairén, alt. 1350 m, *G. C. K. Dunsterville 1171*.

This species is confined to the highlands of Guyana and southeastern Venezuela, where it has been found on several occasions. The plant was first encountered on the expedition to Mount Roraima in British Guiana in 1898, and it was described by Rolfe in 1901.

Brachionidium brevicaudatum is characterized by the short, erect, compact habit; broadly ovate, obtuse, slightly acuminate sepals and petals; minutely ciliate petals; and a unique, sagittate-triangular, ciliate lip. The basal angles extend to either side of the base of the column. Although there is considerable variation in the size of sepals and petals, the lip is relatively constant in size in the specimens examined.

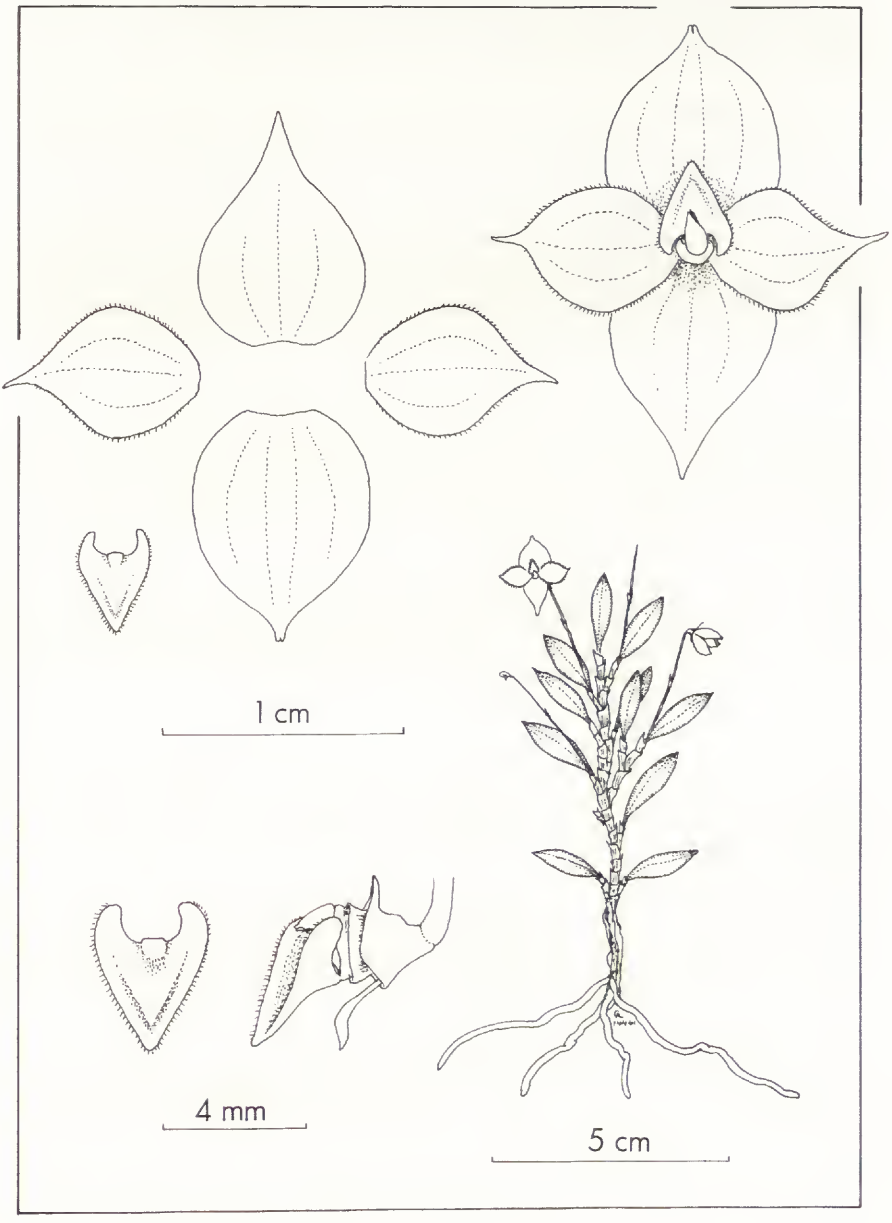


Plate 6. *Brachionidium brevicaudatum* Rolfe

Brachionidium calypso Luer, sp. nov.

Ety.: Named for Calypso, nymph of Greek mythology, who dwelled on a distant, inaccessible island.

Planta grandis suberecta rhizomate crasso vaginis glabris, foliis ellipticis 7-nervatis, flore atropurpureo, sepalo mediano synsepaloque anguste ovatis longiattenuatis longicaudatis, petalis late ovatis obliquis similibus, labello transverse cordato, lobis lateralibus erectis late semi-orbicularibus columnam amplectentibus, lobo mediano late obtuso decurvo, callo suborbiculari pubescenti.

Plant large, epiphytic or terrestrial in loose moss, erect to suberect, up to 20 cm tall, the rhizome relatively stout, occasionally branching, 1-2.5 cm long between ramicauls, enclosed by 2-3 tubular, mucronate sheaths; roots coarse from nodes and near the base. Ramicauls stout, suberect, 5-6 mm long, enclosed by 2 tubular, mucronate sheaths. **Leaf** erect or suberect, coriaceous, elliptical, acute to subacute, 15-30 mm long including a petiole 2-3 mm long, 7-15 mm wide, 7-veined. **Inflorescence** a solitary, non-resupinate flower borne by a slender, erect peduncle 15-20 mm long, with a bract near the middle, from near the apex of the ramicaul; floral bract inflated, acute, mucronate, 4 mm long, enclosing the pedicel and part of the ovary; pedicel 1 mm long, with a filament 5 mm long; ovary 3 mm long; **sepals** dark wine purple, minutely ciliate, the middle sepal narrowly ovate, acute, long-attenuate, 45 mm long, the blade ca. 14 mm long, 5 mm wide, 3-veined, the tail filiform, ca. 30 mm long, the lateral sepals connate into a narrowly ovate, acute, long-attenuate synsepal, 45 mm long, the blade ca. 15 mm long, 6 mm wide, 4-veined, the tail filiform, ca. 30 mm long, the tips free for 23 mm; **petals** deep wine red, acutely reflexed, minutely ciliate, ovate, oblique, acute, acuminate, the blade 10 mm long, 6 mm wide, 3-veined, the tail 20 mm long; **lip** purple, transversely cordate, 4 mm long, 5 mm wide expanded, sides erect, broadly semi-orbicular with the basal angles narrowly obtuse, incurved, embracing the column, the middle lobe broadly obtuse, acutely decurved, the disc with a rounded, pubescent callus; **column** stout, 1 mm long; pollinia 6.

PANAMA: Prov. of Chiriquí: La Chumblada above Guadalupe, 15 July 1979, *R. L. Dressler 5838* (Holotype: MO), C. Luer illustr. 14561; trail along continental divide, northeast of Boquete, above Palo Alto, alt. 7000 ft., 23 May 1979, *B. Hammel 7381* (MO).

This species is apparently endemic in western Panama. It is characterized by the large, more or less erect habit; elliptical leaves; dark purple flowers; narrowly ovate, attenuate, long-caudate, minutely ciliate sepals; and a comparatively large, unique, cordate lip with erect, rounded sides and a decurved apex.

Vegetatively *B. calypso* is similar to three other sympatric species of the genus: *B. dressleri*, *B. lucanoideum* and *B. satyreum*. All three species have large, deep wine red flowers of a basic similarity, but the lip of each is distinct. They inhabit the cool, wet crests of the continental divide of Panama, and they are usually found growing terrestrially in deep mossy humus.

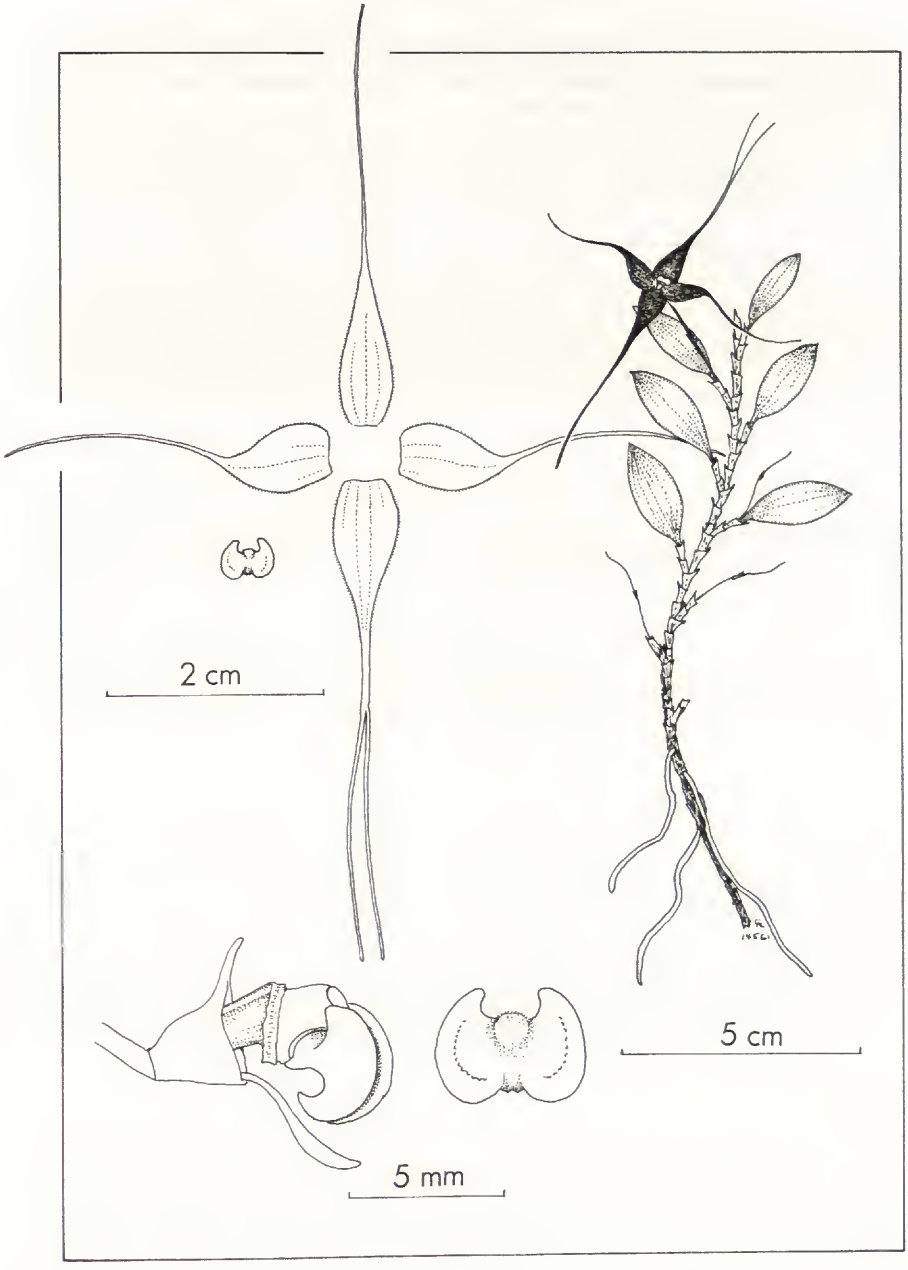


Plate 7. *Brachionidium calypso* Luer

Brachionidium capillare Luer & Hirtz, sp. nov.

Ety.: From the Latin *capillaris*, "capillary," referring to the hairlike tails of the sepals and petals.

Planta perparva repens rhizomate gracile elongato, pedunculo gracile folio suborbiculato leviter longiore, sepalis niveis eciliatis, sepalo impari ovato acuto longissime caudato, synsepalo anguste triangulari longissime caudato, petalis anguste ovatis obliquis acutis longi-acuminatis, labello late ovato, angulis lateralibus acutis, apice obtuso apiculato.

Plant very small, terrestrial, repent, the rhizomes slender, branching, 5-6 mm long between ramicauls, with 3 closely fitting sheaths; roots comparatively coarse, produced singly from nodes on the rhizome. Ramicauls suberect, 0.5 mm long, enclosed by 2 tubular sheaths. **Leaf** erect to suberect, coriaceous, suborbicular, 5-6 mm long, 4.5-6 mm wide, 5-veined, the rounded apex notched with an apiculum in the sinus, the rounded base contracted into a petiole less than 1 mm long. **Inflorescence** a solitary, snow-white, non-resupinate flower borne by an erect, slender peduncle ca. 1 cm long, with a bract near the middle; floral bract, infundibular, mucronate, 1 mm long, enclosing pedicel and ovary; pedicel thick, 0.25 mm long, with a protruding filament 1.5 mm long; ovary 1 mm long; **sepals** eciliate, the middle sepal narrowly ovate, acute, acuminate, long-caudate, 13 mm long including the capillary tail 10 mm long, 1.5 mm wide near the base, barely 3-veined, the lateral sepals connate into a narrowly triangular, acute, long-attenuate synsepal, 9.5 mm long, 1 mm wide at the base, 2-veined; **petals** eciliate, narrowly ovate, oblique, acute, acuminate, long-caudate, 10 mm long including the capillary tail 8 mm long, 1.2 mm wide near the base, 1-veined; **lip** broadly ovate, 1.5 mm long, 1.5 mm wide, with acute, decurved lateral angles, concave above the middle, the apex obtuse, apiculate, the disc with a central, flattened, ovoid, microscopically pubescent callus with a minute glenion, the broad base hinged to the column-foot; **column** stout, 1 mm long, bidentate; pollinia 8.

ECUADOR: Prov. of Pastaza: terrestrial in cloud forest north of Mera, alt. 1350 m, 12 April 1985, C. Luer, J. Luer, & A. Hirtz, flowered in cultivation by P. & A. Jesup. 26 April 1987, *C. Luer 12743* (Holotype: MO); Río Hollin, alt. ca. 1000 m, 1994, *A. Hirtz 6159* (MO).

This very small species is apparently endemic in wet forests of eastern Ecuador at a relatively low altitude. It grows terrestrially, often in an intertwined mass of thin, creeping rhizomes with tiny leaves, in loose, leafy, shaded humus.

Brachionidium capillare is recognized by the minute, creeping habit with tiny, round leaves, and small, although long-tailed, non-ciliate, white sepals and petals. The lip is broadly ovate with acute, lateral angles that could be interpreted as small, lateral lobes. The margin of the lip is entire and broadly rounded with a long-apiculate apex.

Like *B. jesupiae*, *P. capillare* was flowered in cultivation by the Jesups in Connecticut where large masses of the plant produce a profusion of flowers. The two species are similar, the leaves of *P. capillare* being smaller and rounded, and the margin of the lip is entire instead of bimarginate as in *B. jesupiae*.

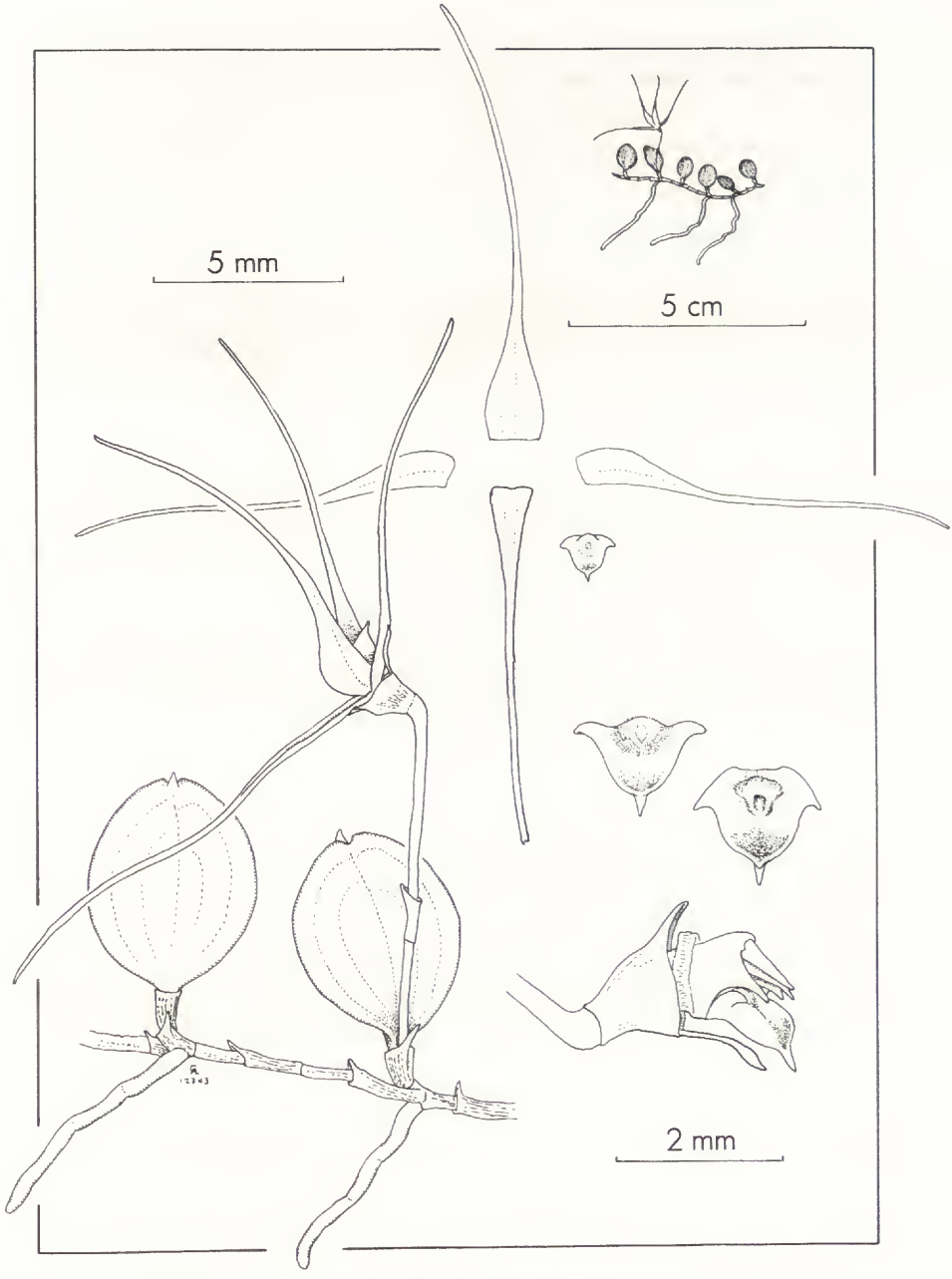


Plate 8. *Brachionidium capillare* Luer & Hirtz

Brachionidium ciliolatum Garay, J. Arnold Arbor. 50: 464, 1969.

Ety.: From the Latin *ciliolatus*, "ciliolate," referring to the floral parts.

Plant small, epiphytic, suberect to erect, up to 5 cm tall, the rhizomes stout, occasionally branching, 1-3 mm long between ramicauls, enclosed by 2-3 imbricating, mucronate sheaths; roots slender from nodes near the base. Ramicauls suberect, 2-5 mm long, enclosed by 2 mucronate sheaths. **Leaf** erect to suberect, coriaceous, elliptical, subacute, apiculate, 12-18 mm long including the petiole 2-3 mm long, 3-5 mm wide, 5-veined, cuneate below into the petiole. **Inflorescence** a solitary, yellow-orange, closed flower borne by an erect, slender peduncle 20-25 mm long, with a bract near the middle; floral bract acute, 2.5 mm long, enclosing the pedicel and part of the ovary; pedicel 1.5 mm long, with a protruding filament 2 mm long; ovary 2 mm long; **sepals** minutely ciliate, the middle sepal obovate, concave, 6 mm long, 3 mm wide, the apex subacute, lightly acuminate, 3-veined, the lateral sepals connate into an ovate, obtuse, lightly acuminate, concave synsepal, 5.5 mm long, 4 mm wide expanded, 4-veined; **petals** elliptical-ovate, concave, oblique, obtuse, lightly acuminate, minutely ciliate, minutely pubescent within, 5.75 mm long, 3.25 mm wide, 3-veined; **lip** ovate-trilobed, 2.75 mm long, 2.5 mm wide expanded, with erect, obtuse lateral angles or lobes with ciliolate margins, the apex acute with minutely fringed margins, not deflexed, the disc with a low, central, minutely pubescent, horse shoe-shaped callus, concave anteriorly, the base broadly hinged to the column-foot; **column** stout, 0.5 mm long excluding the anther; pollinia 6.

PUERTO RICO: Pico del Oeste, Sierra de Loquillo, alt. 1020 m, 13 Jan. 1968, *R. A. Howard & L. I. Nevling 16929* (AMES, type of *B. ciliolatum*), C. Luer illustr. 14734.

This little species is exceedingly rare, having been collected in flower but once. The accompanying illustration was made from a flower from the type, hydrated in concentrated ammonia. A plant without flowers has recently been discovered at the type-locality by Ackerman where it will be observed. According to the original collectors, the flowers "apparently do not open."

Vegetatively this species is similar to *B. parvum*, with which it is sympatric, and which is widely distributed in the Antilles. The sepals of the latter are caudate, and the lip is transverse. The sepals and petals of *B. ciliolatum* are minutely ciliolate and without tails. The lip is longer than broad with erect, ciliolate, obtuse lobes below the middle, and an acute, ciliolate middle lobe. The disc is distinctly concave anterior to a central, horse shoe-shaped callus.

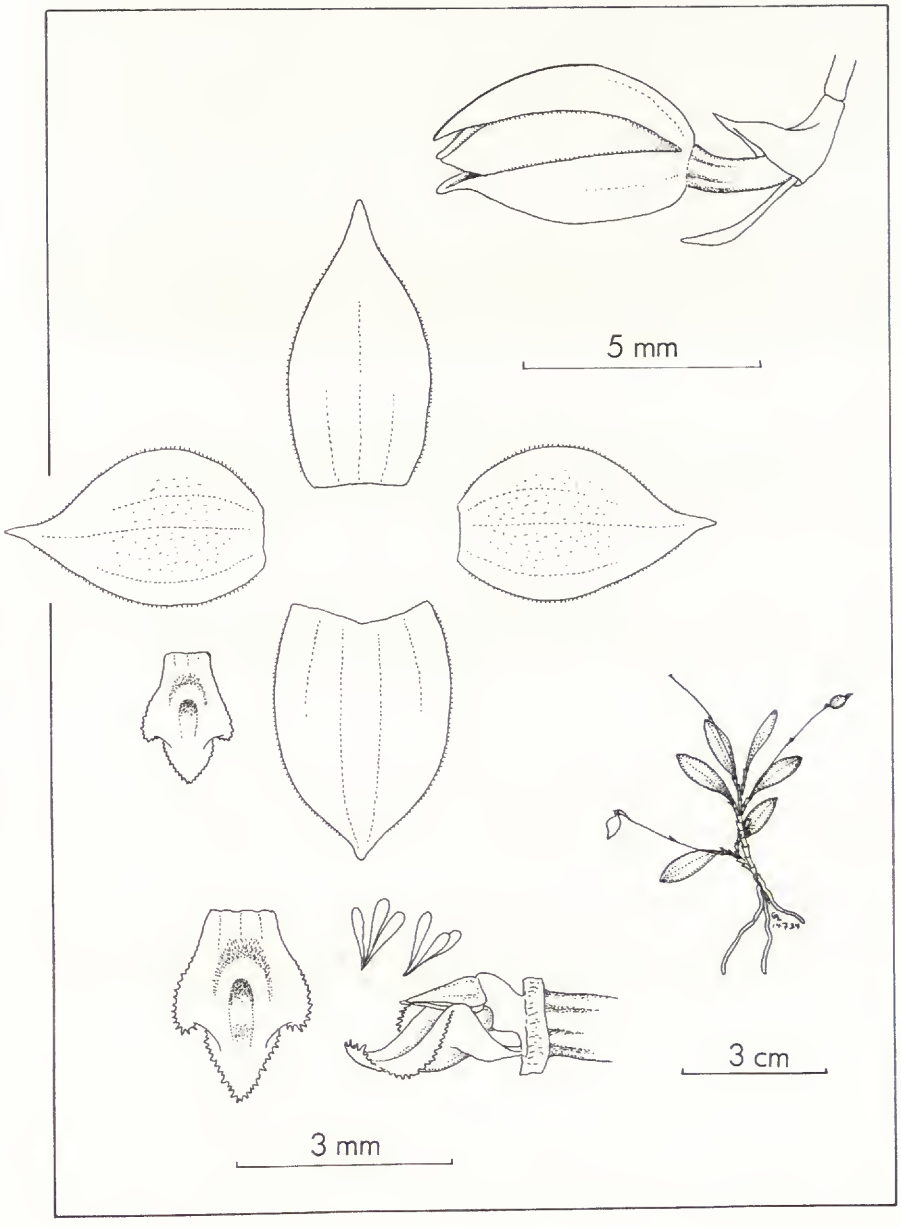


Plate 9. *Brachionidium ciliolatum* Garay

Brachionidium cruzae L.O.Williams., Brittonia 14: 441, 1962.
Ety.: Named in honor of Miss Marcela Cruz, who first collected this species.

Plant small, terrestrial, suberect to erect, up to 10 cm tall, the rhizomes stout, occasionally branching, 3-5 mm long between ramicauls, enclosed by 3 imbricating, long-mucronate sheaths, minutely scurfy on the margins, minutely lobulated on the basal margin; roots coarse from nodes near the base. Ramicauls suberect, 3-5 mm long, enclosed by 2 mucronate sheaths. **Leaf** erect to suberect, coriaceous, prominently veined, elliptical, acute, apiculate, 12-20 mm long including the petiole 1-2 mm long, 5-8 mm wide, 7-veined, cuneate below into the petiole. **Inflorescence** a solitary, green to purple, non-resupinate flower borne by an erect, slender peduncle 18-21 mm long, with an mucronate bract near the middle and another near the base; floral bract long-mucronate, 3-4 mm long, enclosing the pedicel; pedicel 1 mm long, with a protruding filament 4-5 mm long; ovary 3 mm long; **sepals** with margins microscopically cellular, the middle sepal elliptical, acute, acuminate, 8.5-11 mm long, 4-5.5 mm wide, 3-veined, the lateral sepals connate into a broadly ovate-suborbicular, concave synsepal, 9-12 mm long, 6-8 mm wide expanded, 4-veined, the obtuse apex acuminate, bifid about 1 mm at the tip; **petals** ovate, oblique, subacute, shortly acuminate, minutely ciliate, 8-10 mm long, 3-3.5 mm wide, 3-veined; **lip** transversely triangular, 1.5-1.75 mm long, 3.35-3.5 mm wide, with acute, lateral angles, the apex rounded, submarginally callous, subapiculate, the disc with a flat, minutely pubescent, transversely ovoid callus, slightly grooved anteriorly, the base hinged to the column-foot; **column** stout, 0.5 mm long, bidentate; pollinia 6.

COSTA RICA: Prov. of San José: epiphyte in shady forest near sphagnum bog, next to Pan American highway from Empalme to Villa Mills, alt. 2700 m, 18 July 1960, *M. Cruz 28* (Holotype: F). Prov. of Alajuela: Monteverde, Cerro Ojo de Agua, alt. 1730 m, epiphytic on trunk of tree, 6 Sept. 1985, *W. A. Haber & E. Bello 2619* (MO), C. Luer illustr. 14374. Prov. of Limón, Cordillera de Talamanca, Valle de Silencia along Río Terbi, alt. 2300-2400 m, 9 Sept. 1984, *G. Davidse, G. Herrera & M. Grayum 28727* (MO); Cerros Tararia (Tres Picos), alt. 2400-2600 m, 10 Sept. 1984, *G. Davidse, G. Herrera & M. Grayum 28807* (MO).

Although not common, this species is widely distributed in moist forests in Costa Rica. It is similar to most of the other small species characterized by a short, erect habit. The mucronate bracts of the rhizome, however, are minutely scabrous on the margins. The sepals are shortly acuminate without tails, the uppermost synsepal being concave with a minutely bifid acuminate apex. The minutely ciliate petals are oblique with rounded marginal angles; and the lip is transverse with acute lateral angles and a broadly ovate, entire margin.

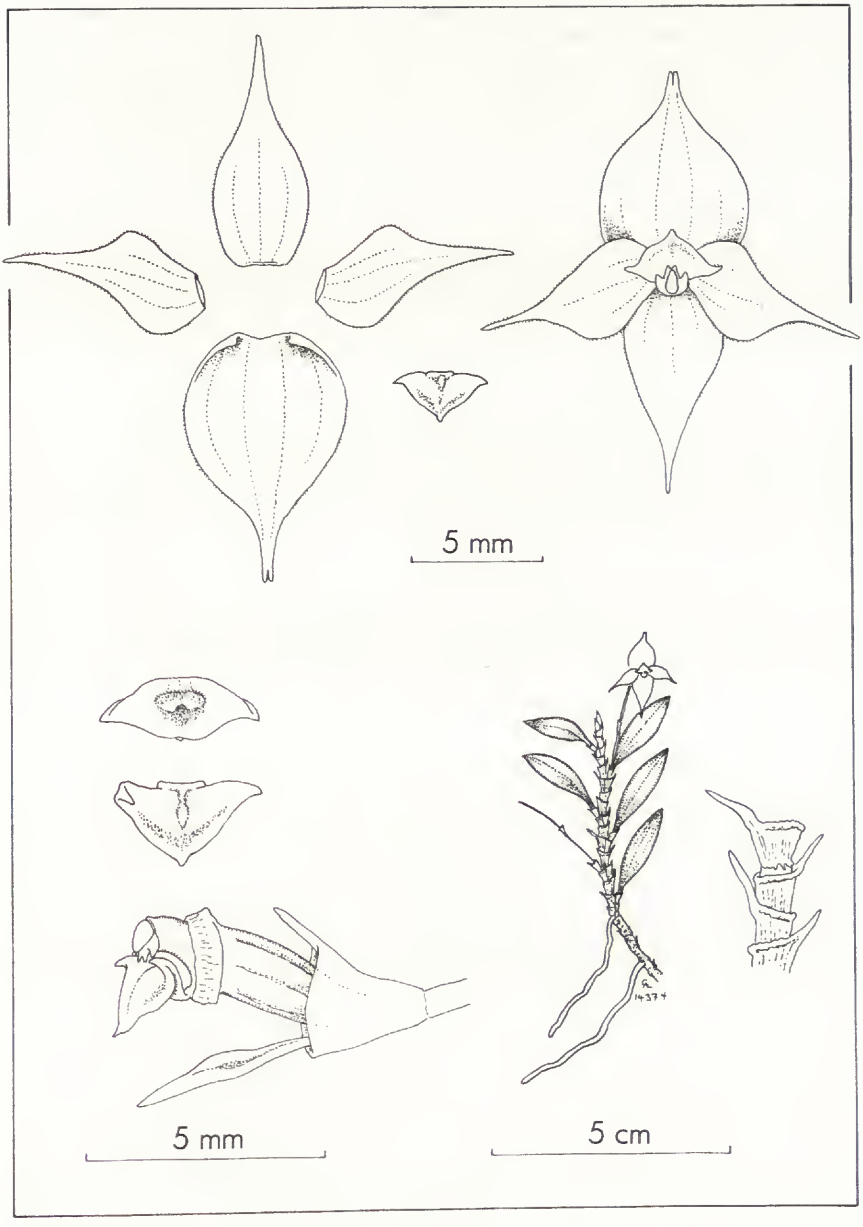


Plate 10. *Brachionidium cruzae* L. O. Williams

Brachionidium dalstroemii Luer, Lindleyana 1: 170, 1986.

Ety.: Named in honor of Stig Dalström of Falun, Sweden, who discovered this species.

Plant large, robust, epiphytic, the rhizome stout, erect, straight, up to 100 cm tall, occasionally branching, 2.5-4 cm long between ramicauls, 3-4 mm thick, with 3 loose, long-mucronate sheaths; roots coarse, from nodes toward the base. Ramicauls suberect, 6-10 mm long, enclosed by 2 similar sheaths. **Leaf** suberect, coriaceous, purple beneath, 18-28 mm long including a petiole 2-4 mm long, the blade elliptical, acute to subacute, 7-11 mm wide, 7- to 9-veined, the base cuneate into the petiole. **Inflorescence** a single, light yellow, non-resupinate flower borne by a peduncle 5-6 mm long, enclosed by 2 inflated, imbricating sheaths, from near the apex of the ramicaul; floral bract inflated, mucronate, 7 mm long; pedicel thick, 0.5 mm long, with a protruding filament 7-8 mm long; ovary 2 mm long, 2 mm thick; **sepals** eciliate, the middle sepal ovate, acute, acuminate, long-caudate, 28 mm long including the slender tail 16 mm long, 6 mm wide, 3-veined, the lateral sepals connate into a triangular-ovate, acute, acuminate, long-tailed lamina, 28 mm long, 6 mm wide expanded, 4-veined, the filiform apices of the tails free for 8-9 mm; **petals** eciliate, ovate, oblique, acute, acuminate, long-caudate, 27 mm long including the tail 15 mm long, 4.5 mm wide, 3-veined; **lip** transversely trapeziform, 3 mm long, 3 mm wide, the lateral angles acute, uncinate, incurved, the apex obtuse with marginal calli, the disc with a central, flattened, minutely pubescent callus; **column** stout, 2 mm long, the margins of the stigmatic lobes 2- to 3-dentate; pollinia 8.

ECUADOR: Prov. of Loja: epiphytic in cloud forest between Loja and Saraguro, alt. 3150 m, 17 Mar. 1984, *C. Luer, S. Dalström, T. Höijer & J. Kuijt 9553* (Holotype: MO). Prov. of Morona-Santiago: in moist forest between Churrucos and Granadillas, eastern slopes from Cuenca, alt. 2600-3000 m, *F. C. Lehmann 7056* (K); road construction between Sigsig and Gualaquiza, 9 Apr. 1968, *G. Harling, G. Storm & B. Ström 8129* (GB); Prov. of Morona-Santiago: east of the pass east of Sigsig, alt. 2700 m, 15 May 1988, *C. Luer, A. Hirtz, W. Flores, A. Andreetta & W. Teague 13367* (MO). Without locality, *F. C. Lehmann 6512* (K).
PERU: Dept. of San Martin: Huallaga, Río Apisoncho, 30 Km above Jucusbamba, alt. 3100 m, 27 Aug. 1965, *A. C. Hamilton & P. M. Holligan 1283* (AMES, K).

This distinctive species was found by Stig Dalström in the dense, scrubby vegetation at the pass north of Loja in southern Ecuador. As is so often the case in this genus, only one specimen was discovered. Fortunately, a fine flower was present; too often specimens of *Brachionidium* are found without flowers, a frustrating event. Since most of these plants of high altitudes refuse to adapt to cultivation, positive identification is impossible. Therefore, a visit to the locality is attempted another year.

This species, apparently infrequent and local at high altitudes in southern Ecuador and Peru, is easily distinguished by the straight, thick, erect rhizome with comparatively small, alternating, distantly spaced ramicauls and leaves. The greenish flower is borne by a slender peduncle. The inflated floral bract engulfs the pedicel, ovary and the basal portion of the flower. The sepals and petals are eciliate with long, slender tails. The lip is transverse with the edge bimarginate.

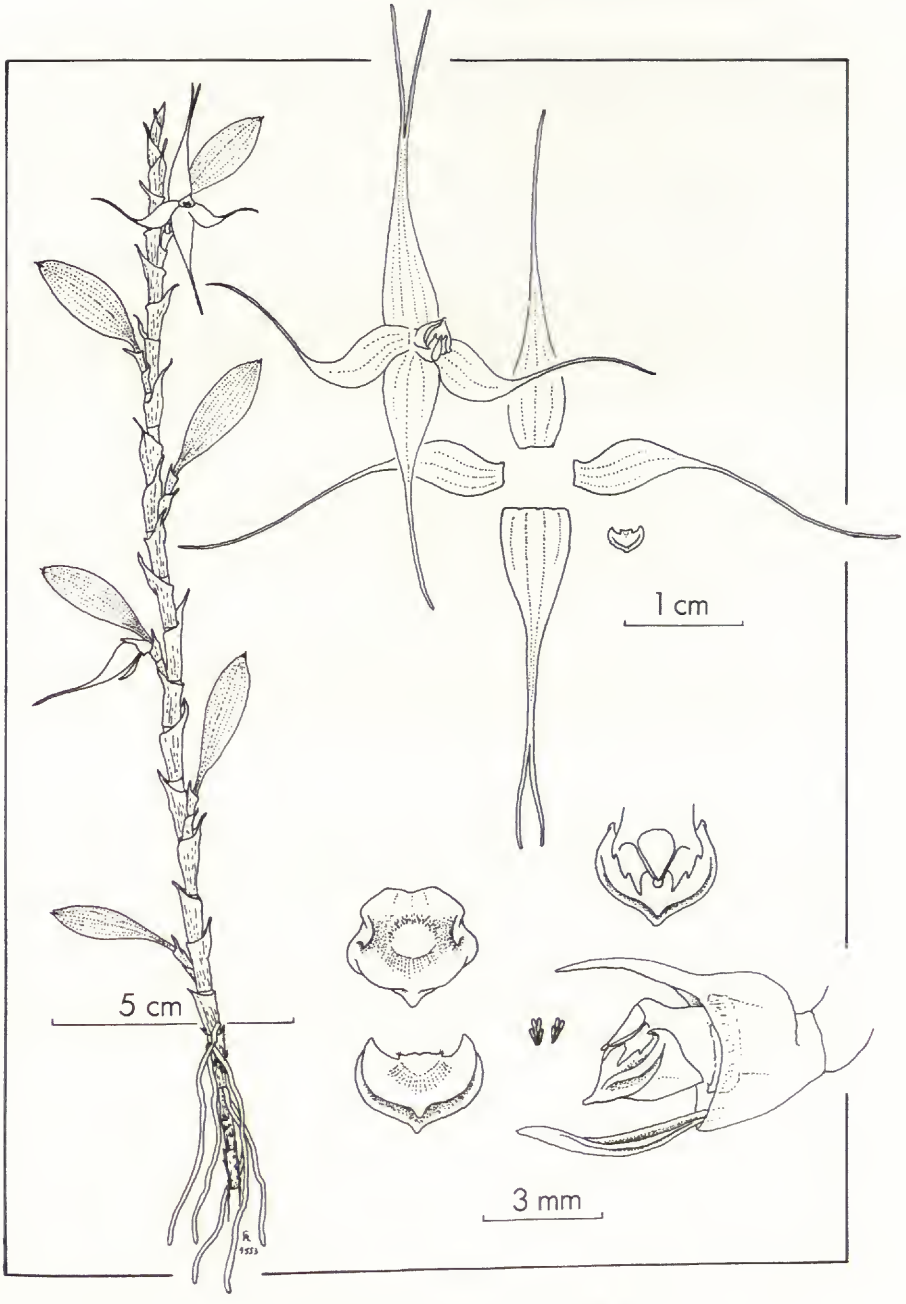


Plate 11. *Brachionidium dalstroemii* Luer

Brachionidium dentatum Luer & Dressler, sp. nov.

Ety.: From the Latin *dentatus*, "toothed," referring to the labellum.

Planta mediocris suberecta rhizomate crasso vaginis glabris longimucronatis, foliis ellipticis 7-nervatis, nervis crassis carinatis, flore parvo, sepalo mediano synsepaloque ovatis longicaudatis, petalis similibus, labello transverse ovoideo, lobis lateralibus acutis incurvatis, apice obtuso apiculato, marginibus denticulatis cum crista submarginali, disco cum callo grandi suborbiculari pubescenti.

Plant medium in size, epiphytic or terrestrial in loose humus, erect to suberect, up to 10 cm or more tall, the rhizome relatively stout, occasionally branching, 5-6 mm long between ramicauls, enclosed by 2-3 tubular, long-mucronate sheaths; roots coarse from near the base. Ramicauls stout, suberect, 5-6 mm long, enclosed by 2 tubular, long-mucronate sheaths. **Leaf** erect or suberect, coriaceous, elliptical, acute, 22-33 mm long including a petiole 2-3 mm long, 8-10 mm wide, 7-veined, the veins thick, carinate. **Inflorescence** a solitary, non-resupinate flower borne by a slender, erect peduncle 20-25 mm long, with a mucronate bract near the middle, from near the apex of the ramicaul; floral bract inflated, acute, mucronate, 4 mm long, enclosing the pedicel and the ovary; pedicel 1 mm long, with a filament 5 mm long; ovary 1.5 mm long; **sepals** appear to have been purple, minutely ciliate, the middle sepal narrowly ovate-suborbicular, concave, the blade 5 mm long, 3 mm wide unexpanded, 3-veined, the apex obtuse, contracted into a filiform tail 9 mm long, the lateral sepals connate into an ovate, concave synsepal, the blade 5 mm long, 4 mm wide, 5.5 mm wide expanded, 4-veined, the apex obtuse, acuminate into a slender tail 13 mm long, the tips free for 2 mm; **petals** broadly ovate, oblique, minutely ciliate, the blade 5 mm long, 3 mm wide, 3-veined, the apex subacute, contracted into a filiform tail 8 mm long; **lip** transversely ovoid, 2 mm long, 2.25 mm wide, the lateral angles acute, incurved, the apex obtuse, apiculate, the margins denticulate-erose, with a denticulate crest inside the margins, the disc with a comparatively large, rounded, elevated, pubescent callus; **column** stout, 1 mm long, pollinia 6.

PANAMA: Prov. of Chiriquí: above Cerro Punta, alt. ca. 2800 m, collected and cultivated by A. Maduro, flowered in cultivation at Cerro Punta, July 1979, *R. L. Dressler s.n.* (Holotype: MO), C. Luer illustr. 14927.

This species is apparently endemic in the wet cloud forest of Cerro Punta in western Panama where it was discovered by Robert Dressler and Andres Maduro. It is distinguished by the erect habit with elliptical leaves with carinate veins, a character found in very few species. The flowers are comparatively small and dark purple. The sepals and petals are minutely ciliate and long-caudate. The unique lip is more or less cordate-ovate and bimarginate with two toothed crests, one within the outer margin.

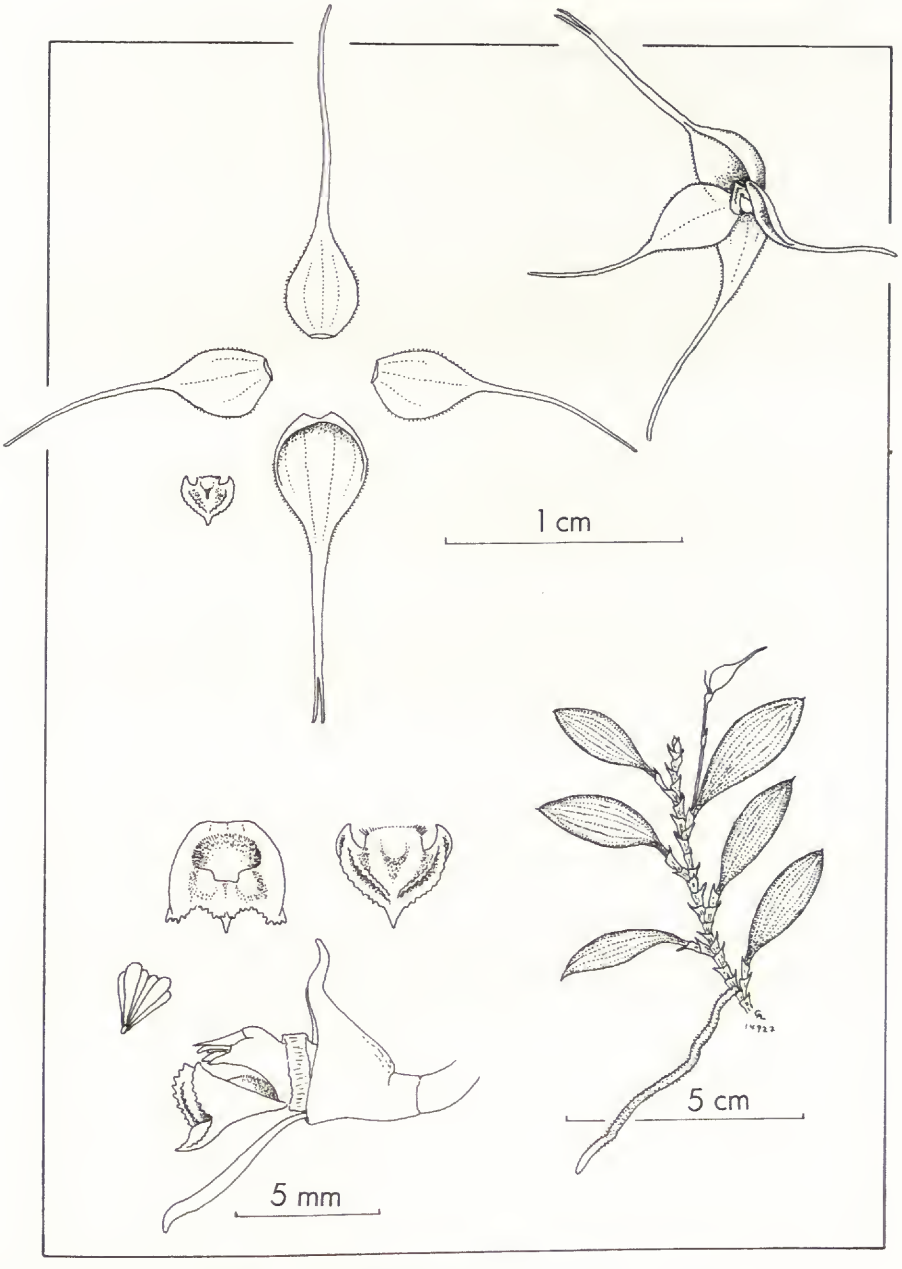


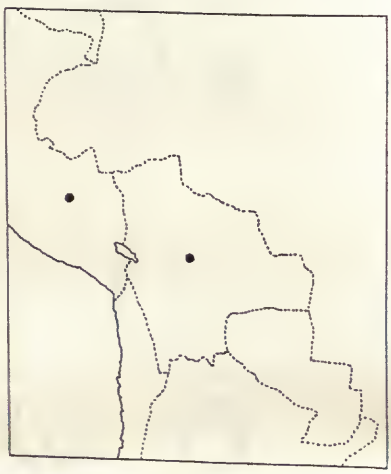
Plate 12. *Brachionidium dentatum* Luer & Dressler

Brachionidium diaphanum Luer & Vásquez, Phytologia 55: 175, 1984.

Ety.: From the Latin *diaphanus*, "colorless and transparent," referring to the qualities of the flower.

Plant small, repent in loose moss, the rhizomes slender, branching, 3-12 mm long between ramicauls, with 2 closely fitting sheaths; roots comparatively coarse, produced singly from nodes on the rhizome. Ramicauls suberect, slender, 4-5 mm long, enclosed by 2 tubular sheaths. **Leaf** erect, coriaceous, narrowly elliptical, acute, 15-22 mm long, 4-6 mm wide, 5- to 7-veined, the base cuneate into a petiole 1-1.5 mm long. **Inflorescence** a solitary, non-resupinate flower borne by an erect, slender peduncle 6-7 mm long, with a bract below the middle; floral bract infundibular, 4 mm long, enclosing pedicel and ovary; pedicel thick, 1 mm long, with a protruding filament 4 mm long; ovary stout, 2.5 mm long; **sepals** translucent, or transparent white, microscopically ciliate, the middle sepal suborbicular-obovate, 9 mm long, 8.5 mm wide, 3-veined, the apex obtuse, abruptly acuminate into a filiform tail 20 mm long, the lateral sepals connate into an ovate synsepal, 12 mm long, 9 mm wide, 4-veined, the acute apex acuminate into a filiform tail 20 mm long, with the tip bifid for about 10 mm; **petals** similar to the sepals, minutely short-ciliate, ovate, oblique, 8.5 mm long, 7 mm wide, 3-veined, the apex subacute, acuminate into filiform tail 18 mm long; **lip** yellow-white, transversely oblong, concave, 3 mm long, 7 mm wide expanded, with the lateral angles acute, incurved, the broadly rounded apex minutely apiculate, the margins with longitudinal calli, disc with an ovoid, flattened, minutely pubescent callus with a minute glenion, the broad base hinged to the column-foot; **column** stout, rose, 2 mm long, bidentate; pollinia 8.

BOLIVIA: Dept. of Cochabamba: Prov. of Chapare, epiphytic in moss in cloud forest near Pampa Tambo, alt. 2700 m, 28 Oct. 1979, *R. Vásquez 197* (Holotype: SEL; Isotype: Herb, Vásquezianum), C. Luer illustr. 9407; same area, alt. 2500 m, 22 Jan. 1980, *C. Luer*, J. Luer & R. Vásquez 4973 *(SEL); same area, alt.* 2800 m, 14 Nov. 1992, *C. Luer, J. Luer, R. Vásquez*, D. Ric & W. Teague 16421 *(MO)*.
PERU: Dept. of Cuzco: Paucartambo, prostrate in humus, Pillahuata, Pasco del Aguila, alt. 2800 m, 4 Nov. 1965, *C. Vargas 16772* (AMES).



This small, repent species is known from wet forests of the eastern and northern declivities of southern Peru and central Bolivia where it was first discovered by Roberto Vásquez. It creeps in loose, mossy, leafy humus that lies upon the shaded forest floor. Although comparatively large, the long-tailed, delicate flowers are nearly transparent. The sepals and petals are microscopically ciliate. The anterior margins of the transverse lip are prominently bimarginate with a marginal groove.

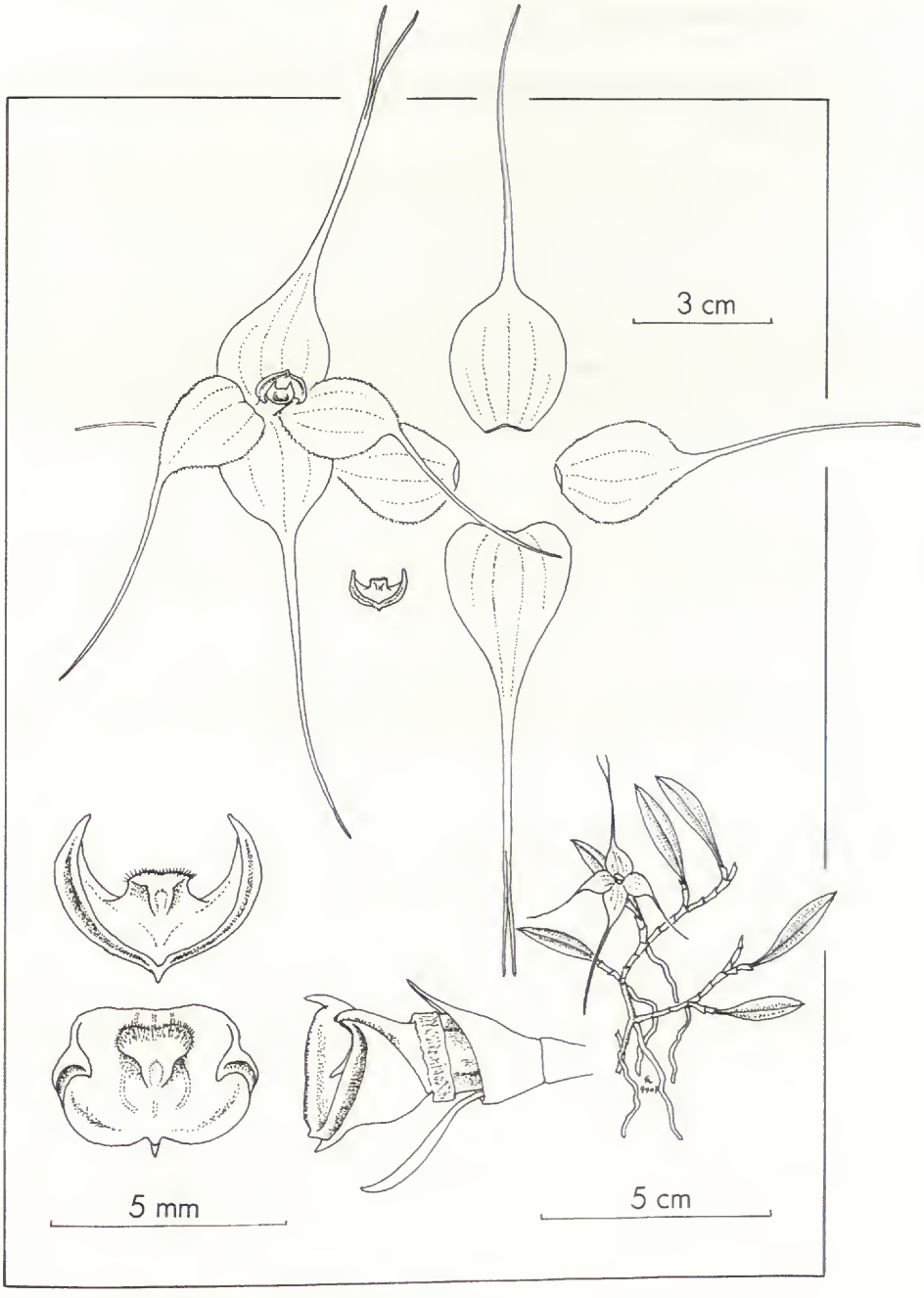


Plate 13. *Brachionidium diaphanum* Luer & Vásquez

Brachionidium dodsonii Luer, sp. nov.

Ety.: Named in honor of Dr. Calaway H. Dodson, who discovered this species.

Planta parva erecta rhizomate radicibusque crassis, floribus pro planta magnis, sepalo impari synsepalo petalisque ciliatis acutis longicaudatis et labello transverse ovato acuto, angulis lateralibus rotundatis, callo humili.

Plant small, erect in loose moss, up to 5 cm tall, the rhizomes stout, 3-8 mm long between ramicauls, with 2-3 tubular, mucronate sheaths; roots coarse, produced from nodes near the base of the rhizome. Ramicauls suberect, slender, 2-4 mm long, enclosed by 2 tubular sheaths. **Leaf** erect, coriaceous, longitudinally veined, elliptical, acute, 10-15 mm long, 5-7 mm wide, 7-veined, the base cuneate into a petiole 1-3 mm long. **Inflorescence** a solitary, non-resupinate flower borne by an erect, slender peduncle 15-22 mm long, with a bract below the middle and at the base; floral bract infundibular, mucronate, 4 mm long, enclosing the pedicel; pedicel thick, 1 mm long, with a protruding filament 4 mm long; ovary stout, 2 mm long; **sepals** translucent light green, minutely ciliate, the middle sepal elliptical, 7-9 mm long, 5 mm wide, 3-veined, the apex acute, acuminate into a filiform tail 10-18 mm long, the lateral sepals completely connate into an ovate, concave synsepal, 8-9 mm long, 7.5 mm wide expanded, 4-veined, the apex acute, acuminate into a filiform tail 15-18 mm long, bifid at the tip; **petals** similar to the sepals, translucent light green, minutely ciliate, ovate, oblique, 8 mm long, 5 mm wide, 3-veined, the apex acute, acuminate into filiform tail 14-16 mm long; **lip** transversely ovate, 2.5 mm long, 3.5 mm wide, the apex obtusely acuminate, the lateral angles broadly rounded, suberect, the disc with a low, central, shortly pubescent callus, the base deflexed, hinged to the column-foot; **column** stout, 1 mm long, 1.5 mm broad, bidentate; pollinia 6.

ECUADOR: Prov. of Napo: Cordillera de Guacamayo, between Baeza and Archidona, terrestrial on wet road cut, alt. 1850 m, 22 June 1987, *C. H. Dodson & M. W. Chase 17206* (Holotype: MO; Isotype: K), C. Luer illustr. 14373. Prov. of Morona-Santiago: terrestrial on a road embankment above the Paute Dam, alt. 1650 m, 25 Jan. 1989, *C. Luer, J. Luer, A. Andreetta, A. Jesup & P. Jesup 14065* (MO); wet forest northwest of Macas, alt. 1750 m, 17 Feb. 1993, *S. Dalström, T. Höijer & H. Wanntorp 1915* (MO).

This small species is apparently endemic in forests of medium altitude on the eastern declivities of the Andes of central Ecuador. It is known to grow locally and abundantly in deep moss that covers wet road embankments. Although superficially similar to other small, erect species with long-caudate and ciliate sepals and petals, i.e. Central American *B. folsomii*, the lip of *B. dodsonii* is distinct. The lip is transversely ovate with a simple margin and an acuminate, or shortly acuminate apex. The lip of *B. folsomii* is roundly obtuse and minutely denticulate.

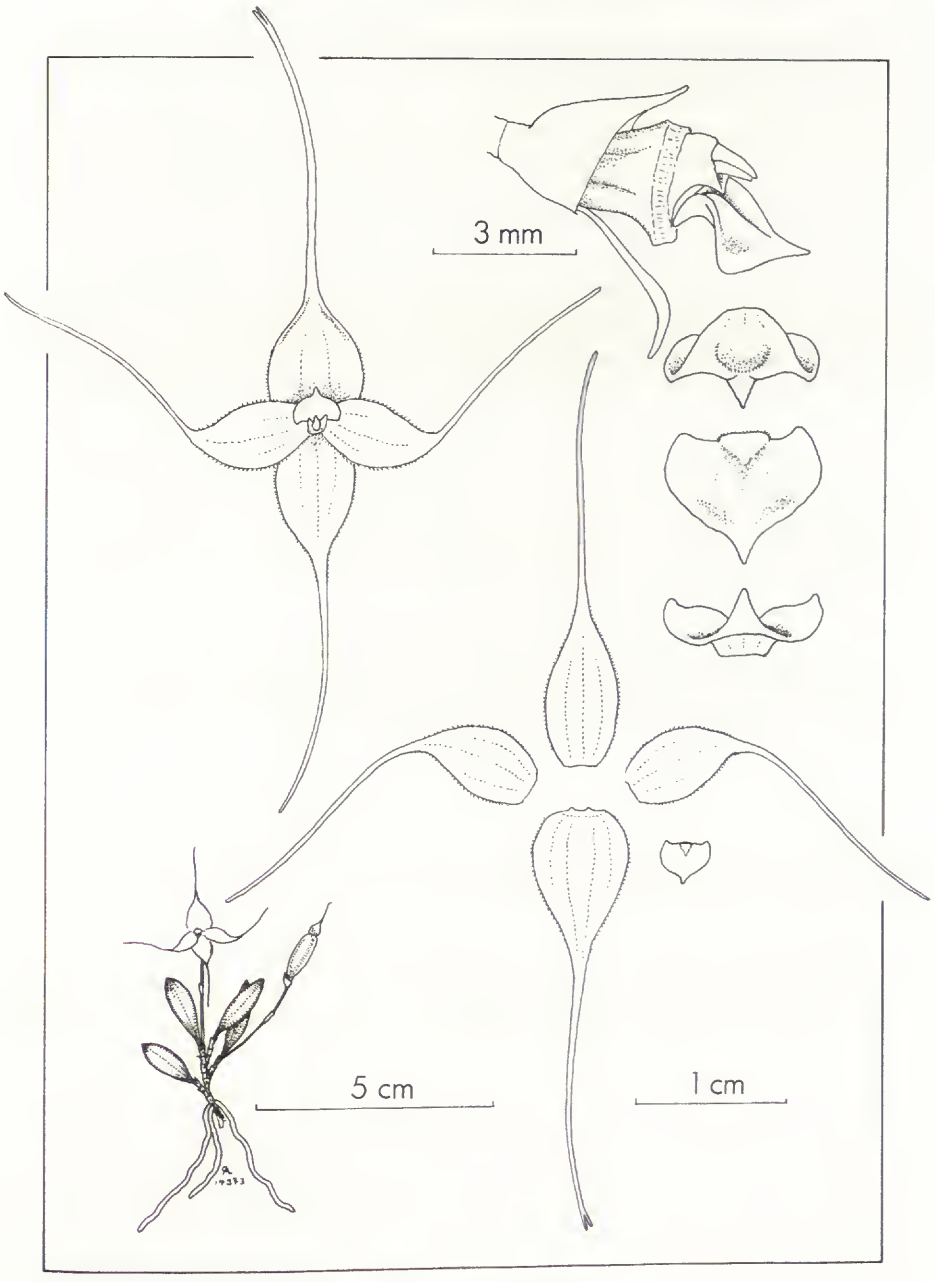


Plate 14. *Brachionidium dodsonii* Luer

Brachionidium dressleri Luer, sp. nov.

Ety.: Named in honor of Dr. Robert L. Dressler who first discovered this species.

Planta grandis suberecta rhizomate crasso vaginis glabris, foliis latis multinervatis, flore grandi pulcherrimo, sepalo mediano synsepaloque ovatis acuminatis minutissime ciliatis longissime caudatis, petalis similibus, labello crasso late ovato denticulato.

Plant large, epiphytic or terrestrial in loose moss, erect to suberect, up to 40 cm tall, the rhizome stout, occasionally branching, 1-3 cm long between ramicauls, enclosed by 2-4 pale, tubular, mucronate sheaths; roots coarse from nodes and near the base. Ramicauls stout, suberect, 5-15 mm long, enclosed by 2 tubular, mucronate sheaths. **Leaf** erect or suberect, coriaceous, elliptical, subacute to obtuse, 2-4 cm long including a petiole 2-4 mm long, 1-2 cm wide, 11- to 15-veined. **Inflorescence** a solitary, showy, non-resupinate flower borne by a slender, erect peduncle 4-5 cm long, with a bract near the middle, from near the apex of the ramicaul; floral bract inflated, acute, mucronate, 5 mm long, enclosing the pedicel and part of the ovary; pedicel 1 mm long, with a filament 5-8 mm long; ovary 3 mm long; **sepals** wine purple, minutely ciliate, the middle sepal elliptical-ovate, acute, acuminate, the blade 8-17 mm long, 6-10 mm wide, 3-veined, the tail filiform, 2-5 cm long; lateral sepals connate into an ovate, acute, acuminate synsepal, the blade 8-18 mm long, 6-8 mm wide, 4-veined, the apex split into two tails for 1-2 cm, 2-5 cm long; **petals** wine red, minutely ciliate, ovate, oblique, subacute, acuminate, the blade 7-15 mm long, 5-8 mm wide, 3-veined, the tail 13-25 mm long; **lip** purple, broadly ovate, with the margins denticulate, with the apex rounded, apiculate, 3.5-4 mm long, 3.5-4 mm wide, the basal angles short, erect, the disc thickened with a lesser denticulate line within the within the margin, and a well-delineated oblong glenion at the base, the base broadly and acutely deflexed, hinged to the column-foot; **column** stout, 1 mm long; pollinia 6.

PANAMA: Prov. of Chiriquí: La Chumbada, above Guadalupe, 15 July 1979, *R. L. Dressler 5837* (Holotype: MO), C. Luer illustr. 14558; near the border between Chiriquí and Bocas del Toro northeast of Boquete along the continental divide above Palo Alto past Cerro Pate Macho, alt. 7,000 ft., *R. L. Dressler 6103* (MO); same area, trail to Cerro La Trompeta, alt. 6300 ft., 25 May 1979, *B. Hammel 7458* (MO), C. Luer illustr. 17013; Cerro Homitos, 40 Km northwest of Gualaca, alt. 2238 m, 26 July 1975, *S. Mori & A. Bolten 7484* (MO); Dist. Bugaba, Cerro Punta, alt. 2200 m, 26 Jan. 1985, *H. van der Werff & J. Herrera 6424* (MO), C. Luer illustr. 14377.
COSTA RICA: Prov. of Puntarenas: Coto Brus Las Mellizas, between Cerro Pando and Cerro Nubes, alt. 2465 m, 15 Aug. 1989, *A. Chacón 327* (CR, MO).

This handsome species is apparently endemic in the wet cloud forests along the crests of mountains in western Panama and adjacent Costa Rica. It was first discovered by Robert Dressler along the continental divide above Boquete. It is identified by the large, robust, more or less erect habit; comparatively large, elliptical leaves; and large, purple flowers. The sepals and petals are reflexed, minutely ciliate and long-tailed. The lip is more or less semi-circular in outline, the apex with an apiculum. The margins are denticulate with an irregular line of denticles just within the margin. Among various populations the size of the sepals and petals, and the lengths of their tails are variable, but the morphology of the lip remains the same.

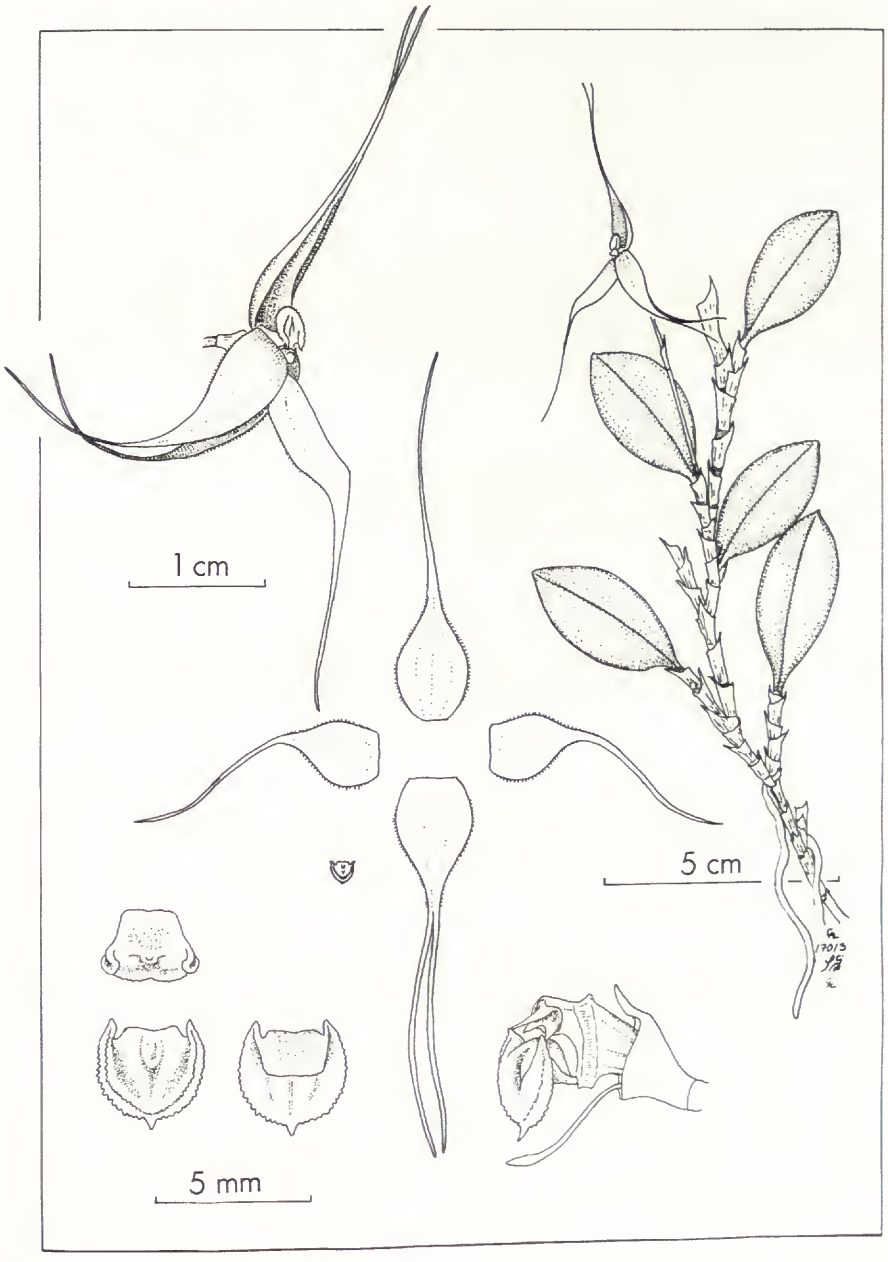


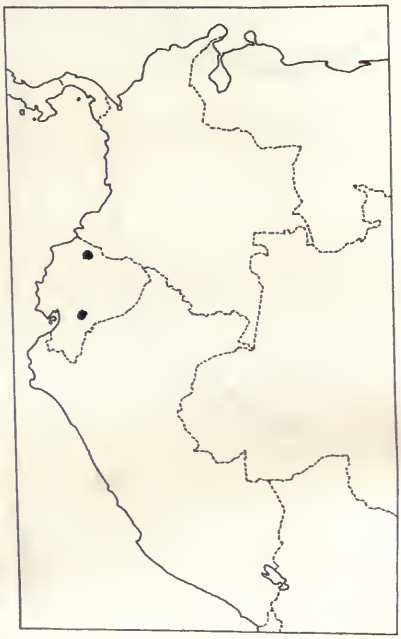
Plate 15. *Brachionidium dressleri* Luer

Brachionidium ecuadorense Garay, Canad. J. Bot. 34: 731, 1956.

Ety.: Named for Ecuador, the country in which the species was discovered.

Plant small to medium in size, terrestrial, long-repent, the rhizomes slender, occasionally branching, 2-4 cm long between ramicauls, with 2-3 closely fitting, acuminate sheaths; roots comparatively coarse, produced singly from nodes on the rhizome. Ramicauls suberect, 5-10 mm long, enclosed by 2 tubular sheaths. **Leaf** erect to suberect, coriaceous, narrowly elliptical, 15-35 mm long, 6-11 mm wide, 7-veined, rugose, the apex acute, apiculate, the base cuneate into a petiole 2-3 mm long. **Inflorescence** a solitary, purple or yellow, non-resupinate flower borne by an erect, slender peduncle 15-25 mm long, with a bract near the middle; floral bract, infundibular, mucronate, 4-5 mm long, enclosing the pedicel and ovary; pedicel thick, 0.5-1 mm long, with a protruding filament 5-6 mm long; ovary 2 mm long; **sepals** microscopically to sparsely ciliate, the middle sepal ovate, acute, acuminate, 8-10 mm long, 4.5-5 mm wide, 3-veined, the lateral sepals connate completely into an ovate, acute, slightly acuminate synsepal similar to the middle sepal, 8.5-10 mm long, 4.5-5 mm wide, 4-veined; **petals** microscopically to nearly coarsely ciliate, ovate, oblique, acute, acuminate, 8-9.5 mm long, 3.5-4 mm wide, 3-veined; **lip** transversely ovate-triangular, 2.5 mm long, 3.5 mm wide, with the lateral angles lightly incurved, the apex broadly obtuse, minutely apiculate, the margins thick, longitudinally concave, the disc with a central, flattened, ovoid, microscopically pubescent callus with a glenion anteriorly, the broad base attached to the column-foot; **column** stout, 1.5 mm long and broad, bidentate; pollinia 8.

ECUADOR: Prov. of Morona-Santiago (not Azuay): on wet rocks near Churrucos, eastern slopes of the Andes east of Sigsig, alt. 2800-3200 m, Oct. 1887, *F. C. Lehmann 7057* (Holotype: NY; Isotype: K), C. Luer illustr. 14460. Prov. of Carchi: Aguas Hediondas, terrestrial in thermal valley west of Tulcán, alt. 3400 m, 6 Mar. 1994, flowers purple, *A. Hirtz 6039* (MO); flowers yellow, *A. Hirtz 6040* (MO), C. Luer illustr. 17490.



This species, first collected by Consul Lehmann in the nineteenth century, occurs rarely at high altitudes in Ecuador. The slender rhizome grows more or less erect, producing at intervals a small, narrowly elliptical leaf. A single root is produced along the rhizome at nodes. The medium-sized, purple or yellow flower is borne near the tip of the leaf. The middle sepal and the synsepal are nearly identical, ovate and slightly acuminate; the petals are very similar and variously ciliate, from microscopic to nearly coarse; the lip is transversely triangular with a thick, convex, bimarginate edge. The callus is microscopically pubescent with a distinct glenion.

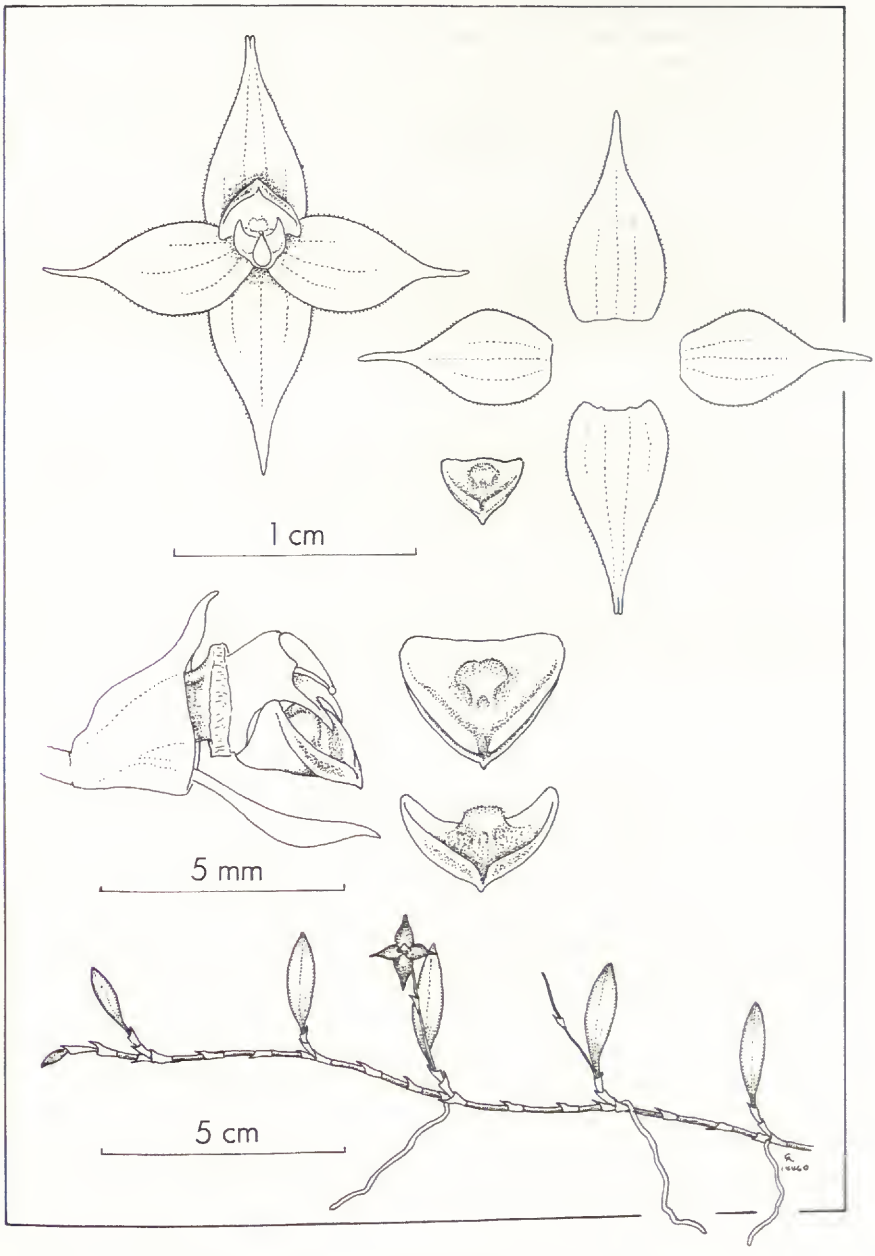


Plate 16. *Brachionidium ecuadorense* Garay

Brachionidium elegans Luer & Hirtz, Die Orchidee 37: 23, 1986.

Ety.: From the Latin *elegans*,"elegant," referring to the handsome qualities of the plant.

Plant large, robust, epiphytic, erect, up to 60 cm tall, the rhizome stout, occasionally branching, 1.5-3.5 cm long between ramicauls, enclosed by 3 scurfy, more or less shaggy, tubular sheaths, mucronate at the apex and more or less fimbriate along the lower margin; roots coarse, from near the base. Ramicauls suberect, 8-12 mm long, enclosed by 2 slightly scurfy, tubular sheaths. **Leaf** suberect, coriaceous, elliptical, acute, 3-4 cm long including a petiole 2-3 mm long, 1-2.2 cm wide, 7- to 11-(occasionally 13-)veined, cuneate below into the petiole. **Inflorescence** a solitary, showy, non-resupinate flower borne by a slender, erect peduncle 3.5-4 cm long, with a loose bract near the middle and near the base, from near the apex of the ramicaul; floral bract inflated, mucronate, 3-4 mm long, enclosing the pedicel and ovary; pedicel 0.5 mm long, with a filament 4-5 mm long; ovary 3-4 mm long; **sepals** shiny, eciliate, translucent, the middle sepal yellow to purple, ovate, acute, acuminate, 20 mm long, 7.5 mm wide, 3-veined, the lateral sepals totally connate into a yellow, sub-orbicular, deeply concave synsepal, 20 mm long, 13 mm wide unexpanded, 17 mm wide expanded, 4-veined, the apex abruptly short-acuminate; **petals** minutely short-ciliate, yellow, red-brown to purple, ovate, oblique, acute, acuminate, 21 mm long, 6 mm wide, 3-veined; **lip** purple, transversely ovate-lunate, 3 mm long, 6 mm wide, the lateral angles acute, incurved, the apical margin broadly thickened and rounded, shallowly cleft centrally, with a short, obtuse apiculum, the disc with a transversely ovoid, shortly pubescent callus 1 mm wide; **column** stout, 1 mm long; pollinia 8.

ECUADOR: Prov. of Zamora-Chinchipe: epiphytic in scrub cloud forest east of Loja, alt. 2750 m, 21 March 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10704* (Holotype: MO); same area, alt. 2400 m, 27 Dec. 1947, *R. Espinosa & A. Espinosa 2290* (LOX, NY). Prov. of Morona-Santiago: cloud forest east of Gualaceo, alt. 2900 m, 16 Feb. 1986, *C. Luer, J. Luer, A. Hirtz, W. Flores Y A. Embree 11813* (MO); between Cuenca and PLan de Milagro (Limón), alt. 3000 m, 7 Jan. 1995, *A. Hirtz, X. Hirtz & E. Sanchez 6111* (MO).
PERU: Dept. of Amazonas: Bagua, Cordillera Colán, alt. 8000 ft., 25 Sept. 1978, *P. Barbour 3561* (MO).

This showy species is distinguished by the suberect, stout rhizome enclosed by scurfy sheaths, a large colorful flower with a deeply concave, suborbicular, 4-veined synsepal abruptly contracted into a short apiculum or tail. The shapes of the 3-veined middle sepal, the 3-veined petals and the lip are not remarkably different from those of *B. andreettae* or *B. parvifolium*. The synsepal of *B. andreettae*, merely narrowly acute without a tail, is no wider than the middle sepal. The middle sepal and petals of *B. parvifolium* are 5-veined, and the synsepal is 6-veined, and the sheaths of the rhizome of neither *B. andreettae* nor *B. parvifolium* are scurfy.

Vegetatively *B. elegans* grows erect in tangled brush, in the manner of *B. parvifolium*. The sheaths of the rhizomes and ramicauls are more or less covered by tiny, irregular, scale-like appendages.

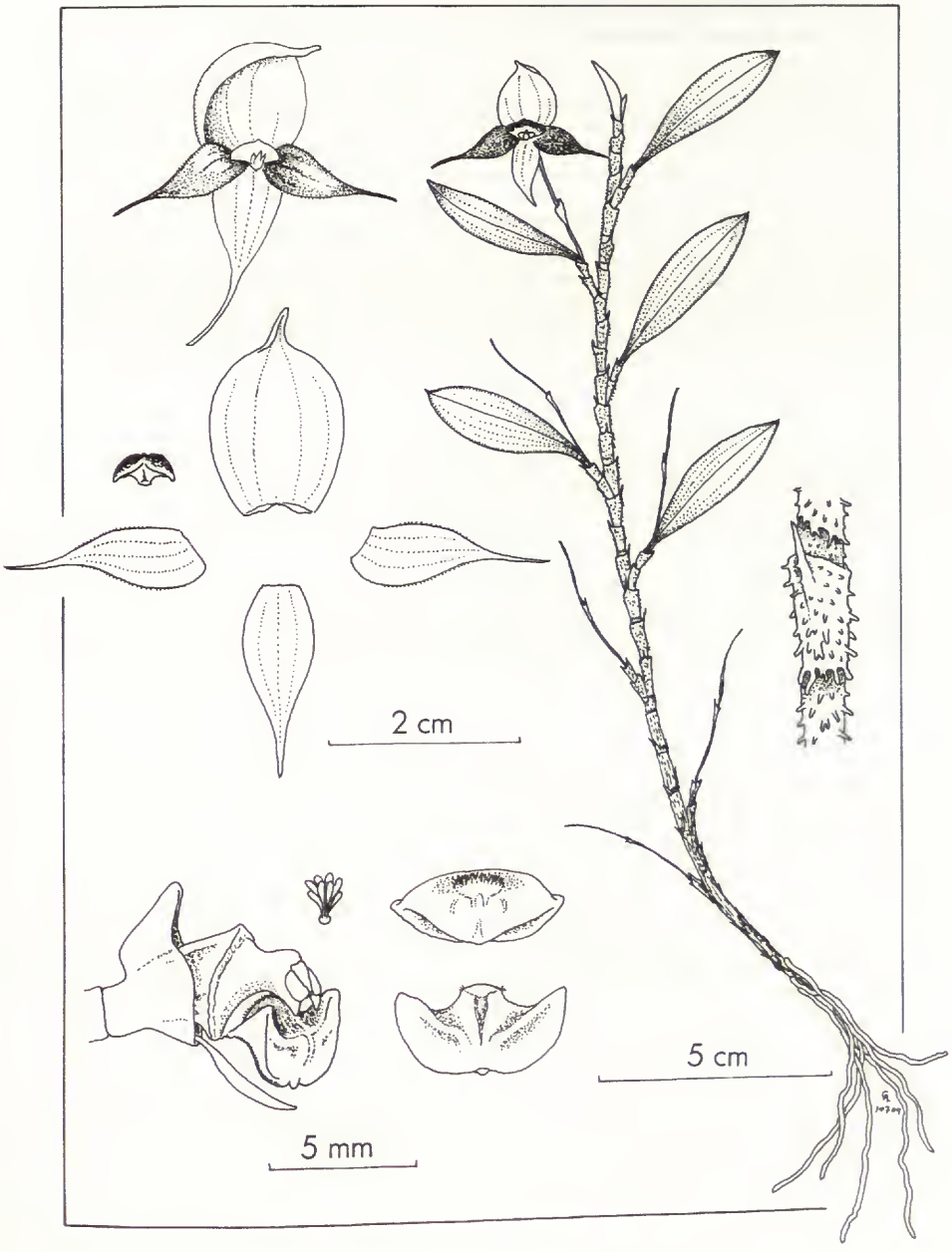


Plate 17. *Brachionidium elegans* Luer & Hirtz

Brachionidium ephemerum Luer & Hirtz, sp. nov.

Ety.: From the Latin *ephemerus*, "ephemeral," referring to the fleeting life of the flower.

Planta parva longirepens rhizomate gracili, pedunculo folio elliptico subaequilongo, sepalo mediano synsepaloque ovatis minutissime ciliatis acutis longicaudatis, petalis similibus sed parvioribus, labello transverse ovoideo, angulis lateralibus acutis, apice late obtuso, callo parvo pubescenti.

Plant small, epiphytic in loose moss, the rhizome comparatively slender, prostrate, long-repent, occasionally branching, up to 20 cm long, 0.8-2 cm long between ramicauls, enclosed by 3 imbricating sheaths; roots solitary from a node. Ramicauls suberect, 1-3 mm long, enclosed by 2 similar sheaths. **Leaf** suberect to erect, coriaceous, elliptical, acute, 8-15 mm long, 4-5 mm wide, 3- to 5-veined, the base cuneate into the petiole. **Inflorescence** a single, non-resupinate, translucent purple, ephemeral flower borne by a slender, erect peduncle 9-11 mm long, with a bract near the middle and another at the base; floral bract infundibular, mucronate, 2.5 mm long, enclosing the pedicel and ovary; pedicel 0.5 mm long, with a filament 4 mm long; **sepals** minutely short-ciliate, the blade of the middle sepal elliptical, 4.5 mm long, 3 mm wide, 3-veined, the apex acute, long-acuminate into a filiform tail 6.5 mm long, the lateral sepals connate into an ovate lamina 5.5 mm long, 3.5 mm wide, 4-veined, the apex acute, long-acuminate into a tail 5.5 mm long, bifid at the tip; **petals** minutely ciliate, ovate, oblique, 4.5 mm long 2.25 mm wide, 3-veined, the apex acute, acuminate into a filiform tail 5.5 mm long; **lip** transversely subovoid, thick, 1 mm long, 2 mm wide, the lateral angles acute, the apex broadly obtuse, the margins callous and channeled along the edge, the disc with an entire, ovoid, pubescent callus with a glenion; **column** stout, 1 mm long; pollinia 6.

ECUADOR: Prov. of Morona-Santiago: epiphytic in wet forest southeast of Sigsig, alt. 2400 m, 13 Jan. 1989, *C. Luer, J. Luer, P. Jesup, A. Jesup, A. Hirtz & S. Ortega 13866* (Holotype: MO). Prov. of Zamora-Chinchipe: Nudo de Sabanilla, elfin forest at pass above Valladolid, alt. 2800 m, 4 Feb. 1985, *G. Harling & L. Andersson 21567* (GB, MO); Parque Nacional Podocarpus, east of Nudo de Cajanuma, alt. 2900 m, 31 Jan. 1989, *J. E. Madsen 85750* (AAU, QCA).

This fragile, little species is endemic in eastern Ecuador at high altitudes. Plants creep in the loose, wet humus at the base of and on the trunks of large trees. Sterile specimens had been discovered several times before a usable flower was finally found. Common to similar species, the delicate flowers last but a short time.

Brachionidium ephemerum is distinguished by the long-repent habit with small, erect, elliptical leaves, and comparatively short peduncles. The sepals and petals are translucent, minutely ciliate and long-tailed. The lateral angles of the transverse, bimarginate lip are acute and the callus is small and entire. It is most similar to the vegetatively larger *B. ecuadorense*, from which it is distinguished by the slender sepaline tails.

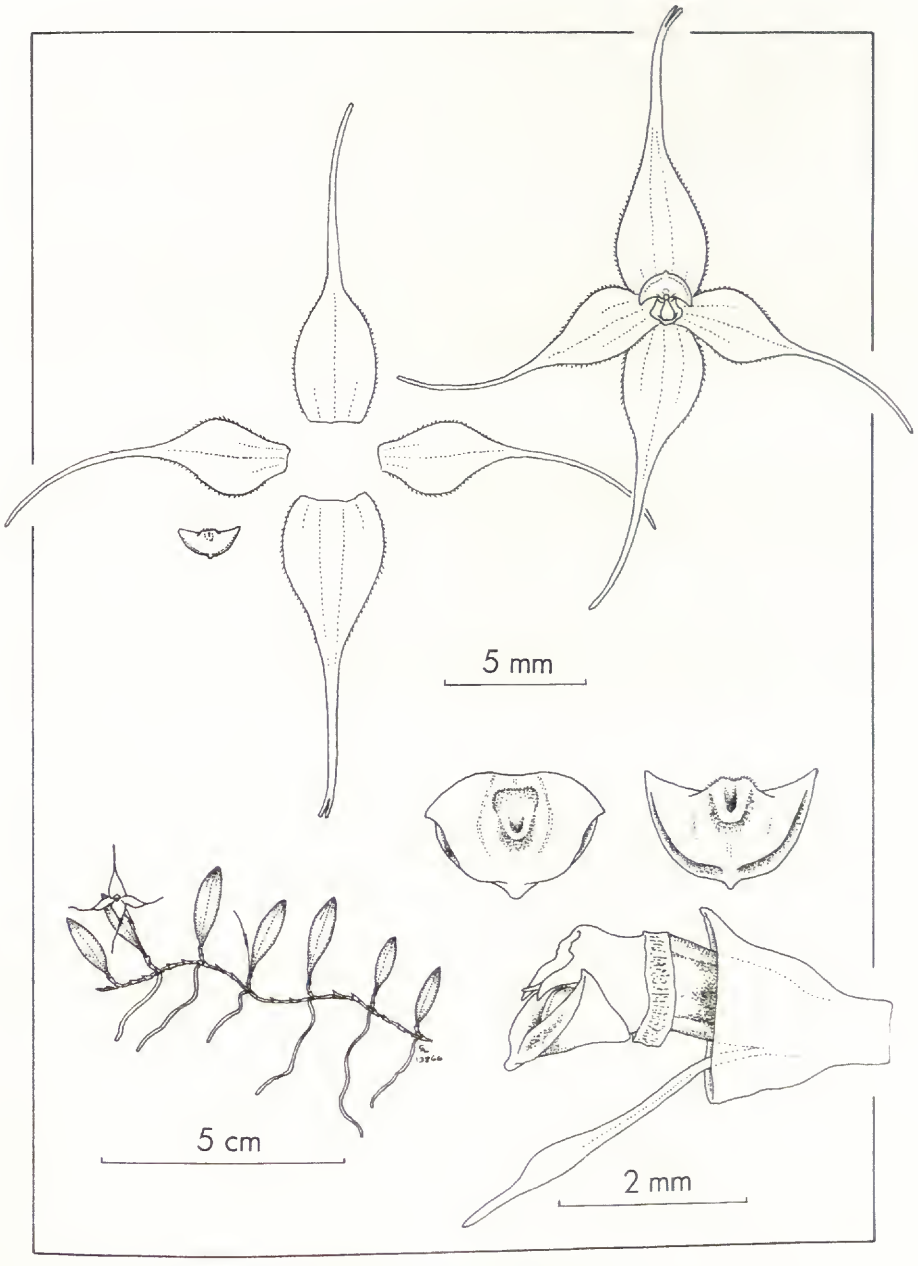


Plate 18. *Brachionidium ephemerum* Luer & Hirtz

Brachionidium escobarii Luer, Lindleyana 1: 172, 1986.

Ety.: Named in honor of Rodrigo Escobar R. of Medellín, Colombia, who discovered this species.

Plant very small, terrestrial, the rhizome repent, occasionally branching, up to ca. 8 cm long, 3-5 mm long with 2-3 pale, glabrous, loosely fitting sheaths between ramicauls; roots coarse, as thick as the rhizome. Ramicauls 1.5-3 mm long, erect, enclosed by 2 similar sheaths. **Leaf** erect, thickly coriaceous, suffused with purple, elliptical, acute, mucronate, 7-11 mm long including the petiole 0.5-1 mm long, 3.5-5 mm wide, the base cuneate into the petiole. **Inflorescence** a single, bright purple, non-resupinate flower borne by a slender, purple peduncle 10-12 mm long, with 2 basal bracts, from near the apex of the ramicaul; floral bract inflated, oblique, 2 mm long; pedicel thick, 1 mm long, with a protruding filament 2.5 mm long; ovary 2 mm long; **sepals** glabrous, the middle sepal ovate, acute, lightly acuminate, 5 mm long, 3 mm wide, the lateral sepals completely connate into an ovate lamina similar to the middle sepal, 5 mm long, 3.5 mm wide; **petals** glabrous, ovate, obtuse, shortly acuminate, 5 mm long, 3 mm wide; **lip** transversely rhomboid or 3-lobed, 2.25 mm long, 3 mm wide, the lateral angles or lobes acute, the apex obtuse, acuminate into an apiculum, with a pair of rounded calli, the disc with a central, flat callus; **column** stout, 1 mm long, pollinia 6.

COLOMBIA: Dept. of. Nariño: terrestrial on damp road-embankment, alt. 3200 m, between Pasto and La Cocha, 30 July 1978, *C. Luer, J. Luer & R. Escobar 3059* (Holotype: MO, Isotype: SEL).

This very small, creeping species was discovered growing on a gravel road embankment in southern Colombia by Rodrigo Escobar. Although this area, rich in numbers of orchids, has been searched many times by many collectors, this tiny species is known to have been found only once.

Brachionidium escobarii is recognized by the minute habit: a horizontally creeping rhizome with an erect ramicaul and a thick, little, elliptical leaf about every three or five millimeters; proportionately large flowers, larger than the leaf; shortly acuminate, glabrous sepals and petals; and a three-lobed lip with acute lateral lobes and an acuminate, bicallous, apical lobe.

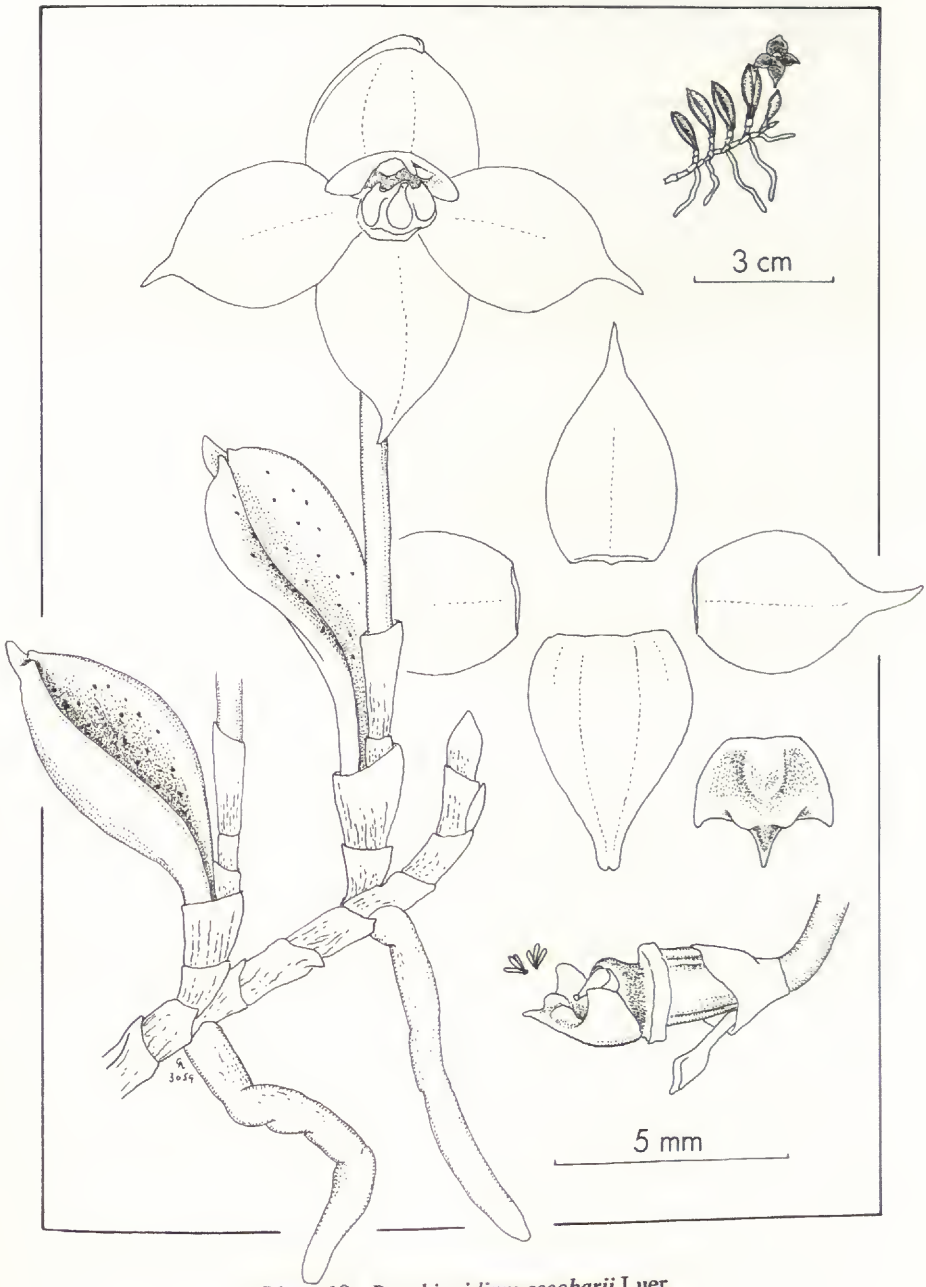


Plate 19. *Brachionidium escobarii* Luer

Brachionidium filamentosum Luer & Hirtz, sp. nov.

Ety.: From the Latin *filamentosus*, "filamentous," referring to the attenuate floral parts.

Planta perparva repens rhizomate gracili vaginis glabris longissime mucronatis, foliis late ellipticis longi-mucronatis 3-nervatis, flore tenui, sepalo mediano synsepaloque breviter ciliatis anguste triangularibus longissime attenuatis filiformibus, petalis glabris filiformibus, labello ovato concavo obtuso apiculato callo pubescenti.

Plant very small, epiphytic, repent, up to 10 cm or more long, the rhizome slender, occasionally branching, 3-5 mm long between ramicauls, enclosed by 3 tubular, long-mucronate sheaths; roots slender, from nodes along the rhizome. Ramicauls suberect, 1-1.5 mm long, enclosed by 2 tubular, long-mucronate sheaths. **Leaf** erect or suberect, coriaceous, elliptical, with the apex obtuse, notched, long-apiculate, the blade 5-6 mm long including a petiole 1 mm long, 3.5-4 mm wide, 3-veined, broadly cuneate below into the petiole. **Inflorescence** a solitary, non-resupinate, delicate flower borne by a filamentous, erect peduncle 15-18 mm long, with a bract near the middle, from near the apex of the ramicaul; floral bract inflated, acute, 2 mm long, enclosing the pedicel and part of the ovary; pedicel 1 mm long, with a filament 2 mm long; ovary 1 mm long; **sepals** translucent, suffused with brown on the middle thirds, minutely ciliate, the middle sepal narrowly triangular, acute, long-acuminate, 17 mm long, 1.75 mm wide at the base, 1(3)-veined, the lateral sepals connate into a narrowly triangular, acute, entire, long-acuminate synsepal, 18 mm long, 2 mm wide at the base, 2-veined; **petals** translucent, glabrous, narrowly triangular, oblique, acute, long-acuminate, filiform, 12 mm long, 1 mm wide, 1-veined; **lip** ovate, concave, not deflexed upon itself, 1.25 mm long, 1.25 mm wide, the sides broadly rounded, incurved, the apex acute, apiculate, the disc with a raised, flat, pubescent callus above the base; **column** stout, 0.5 mm long; pollinia 6.

ECUADOR: Prov. of Esmeraldas: epiphytic in mossy forest west of Lita toward San Lorenzo, alt. 700 m, 12 Jan. 1992, *C. Luer, J. Luer, A. & X. Hirtz, P. & A. Jesup, M. Evans & J. del Hierro 15563* (Holotype: MO).

COLOMBIA: Dept. of Chocó: epiphytic, south-west ridge leading to Alturas de Nique on the Panamanian border, alt. 1100-1200 m, 30 Dec. 1980, *R. L. Hartman 12434* (MO), C. Luer illustr. 14812.

PANAMA: Prov. of Darien: epiphytic in mossy, cloud forest along Cuasi-Cana trail between Cerro Campamiento and La Escalera, "páramo" east of Tres Bocas, 30 Apr. 1968, *J. H. Kirkbride, Jr. & J. A. Duke 1281* (MO).

This tiny species occurs in the low, wet forests from the Darien of Panama and the Chocó of Colombia to lowland northwestern Ecuador. It is reminiscent of other minute, creeping species with more or less round leaves, but *B. filamentosum* is distinguished by the long, hairlike tails of the floral parts, and an ovate, concave lip with an apiculate apex.

The Panamanian collection cited above is without flowers, but identical plants from a nearby locality in Colombia leave little doubt about their identity.

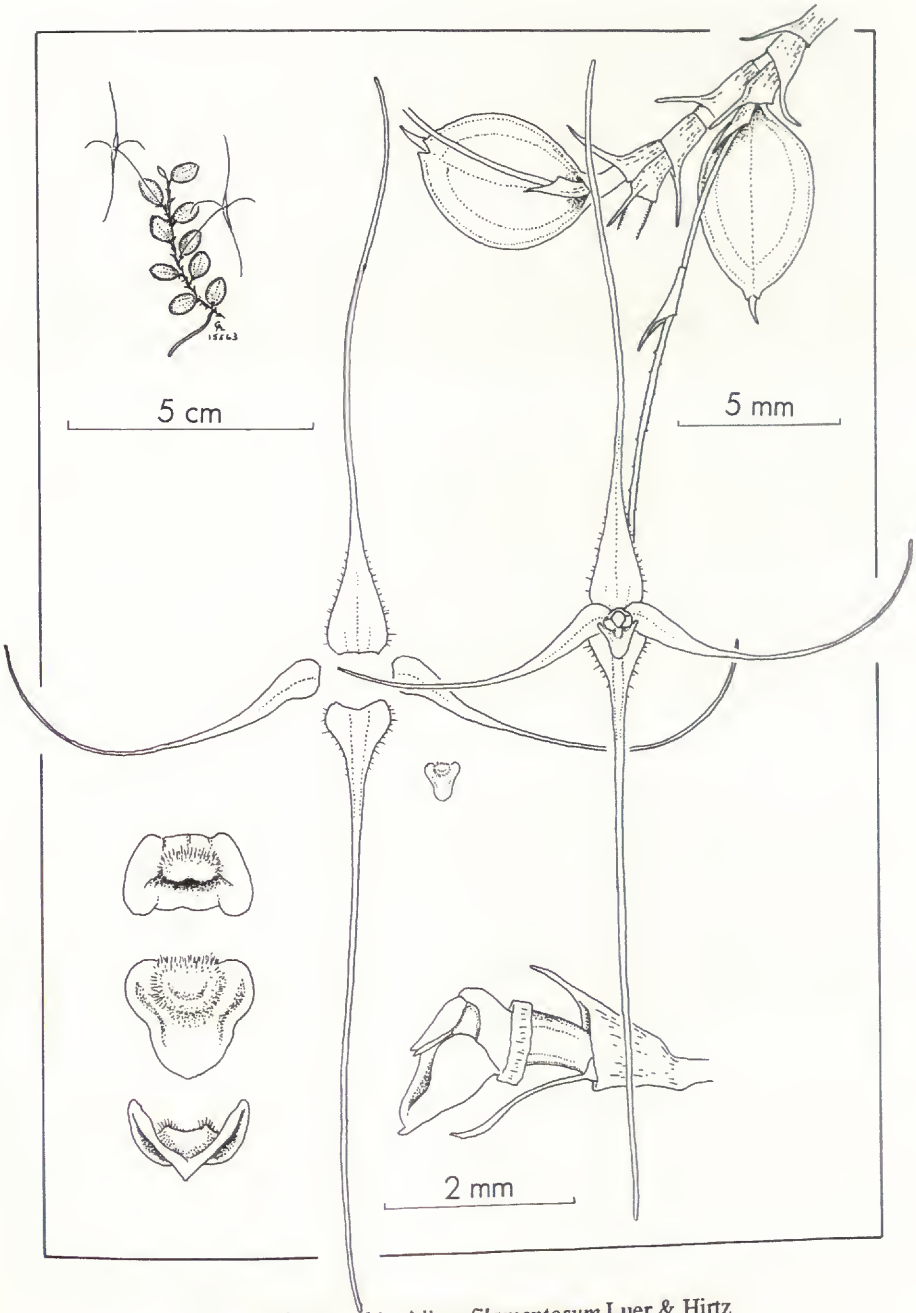


Plate 20. *Brachionidium filamentosum* Luer & Hirtz

Brachionidium folsomii Dressler, Orquideología 15: 154, 1982.

Ety.: Named in honor of Dr. James P. Folsom, who discovered this species.

Plant small, epiphytic to terrestrial, the rhizome relatively stout, erect, straight, up to 7 cm tall, occasionally branching, 2-5 mm long between ramicauls, with 2 loose, mucronate sheaths; roots coarse, from the base. Ramicauls erect, 4-7 mm long, enclosed by 2 similar sheaths. **Leaf** suberect, coriaceous, 13-30 mm long including a petiole 2-3 mm long, the blade elliptical, acute to subacute, 6-11 mm wide, 7-veined, the base cuneate into the petiole. **Inflorescence** a single, bright purple, non-resupinate flower borne by a peduncle 2-3 cm long, with a bract near the middle and another near the base, from near the apex of the ramicaul; floral bract infundibular, mucronate, 3-4 mm long; pedicel thick, 1 mm long, with a protruding filament 5 mm long; ovary 2.5 mm long; **sepals** minutely short-ciliate, the middle sepal elliptical, 10 mm long, 6 mm wide, the acute apex acuminate into a filiform tail 16-19 mm long, 3-veined, the lateral sepals connate into an ovate, concave, ovate, acute, acuminate, long-tailed synsepal, the blade 10 mm long, 7 mm wide, 4-veined, the filiform tail 16-19 mm long, the apex of the tail entire or minutely bifid; **petals** minutely short-ciliate, ovate, oblique, acute, acuminate, long-caudate, the blade 8 mm long, 5 mm wide, 3-veined, the filiform tail 15 mm long; **lip** transversely ovoid, 2 mm long, 2.5-4 mm wide, the lateral angles acute, incurved, the margin minutely erose to denticulate, usually with an additional row of minute denticles below the margin, the apex rounded, minutely apiculate, the disc with a low, central, flattened, minutely pubescent callus, with a small but well-formed glenion; **column** stout, 1 mm long, bidentate; pollinia 6.

PANAMA: Prov. of Coclé: Alto del Calvario, north of Aserradero El Copé, terrestrial on road cuts, alt. 800-850 m, 23 Feb. 1982, *R. L. Dressler 6032* (Holotype: US; Isotype: PMA); same area, 1 Sept. 1977, *R. L. Dressler 5685* (MO); same area, alt. 930 m, 19 Feb. 1985, *C. Luer, J. Luer, R. Dressler & K. Dressler 10630* (MO). Prov. of Veraguas: near Santa Fe, trail to top of Cerro Tute, alt. 4400 ft., 6 Oct. 1979, *T. Antonio 2018a* (MO); Cerro Tute, northwest of Santa Fe, alt. 900-1250 m, in fruit, 25 Oct. 1975, *R. L. Dressler 5206* (MO); Cerro Arizona, west of Santa Fe, in fruit, 8 Sept. 1979, *R. L. Dressler 5848* (MO).

COSTA RICA: without locality, alt. 2000 ft., 1867, *A. Endres 58* (W). Prov. of Alajuela: Alto Palomo, west of summit of Volcán Poás, alt. 1800 m, 4 May 1969, *R. W. Lent 1645* (F); Upala, Bijagua El Pilón, Atlantic side of Volcán Tenorio, alt. 1500-1800 m, 23 July 1988, *G. Herrera 2146* (CR, MO). Prov. of Guanacaste: Parque Nacional Guanacaste, Estación Pitilla, Fila Orosilito, alt. 450-1200 m, 14 June 1989, *M. M. Chavarría, B. Hammel & Q. Jiménez INBio 13* (CR, MO). Prov. of Puntarenas: Cordillera de Tilarán, Monteverde, El Brillante, terrestrial, alt. 1550-1580 m, 4 Sept. 1976, *V. J. Dryer 753* (F; MO), C. Luer illustr. 14557.

GUATEMALA: Prov. of Alta Verapaz: La Escalera, collected by W. Teague and P. Meng, flowered in cultivation by W. Teague, Dec. 1989, *C. Luer 14567* (MO).

The first record of this little species consists of three superb, pencil illustrations made in the nineteenth century by A. R. Endres in Costa Rica that are deposited in Reichenbach's herbarium in Wien, but no voucher specimen is present. This species is now known to be widely distributed through Central America from Guatemala into Panama.

Brachionidium folsomii is a small, erect, leafy plant that often grows in abundance, epiphytically on large tree trunks or terrestrially in humus or in the disturbed soil of road cuts. The proportionately large, slender-tailed flowers are held above the little foliage. The sepals and petals are minutely ciliate. The margins of the transversely ovate lip are minutely erose or denticulate, and another row of minute teeth or tubercles can usually be seen below the margin.

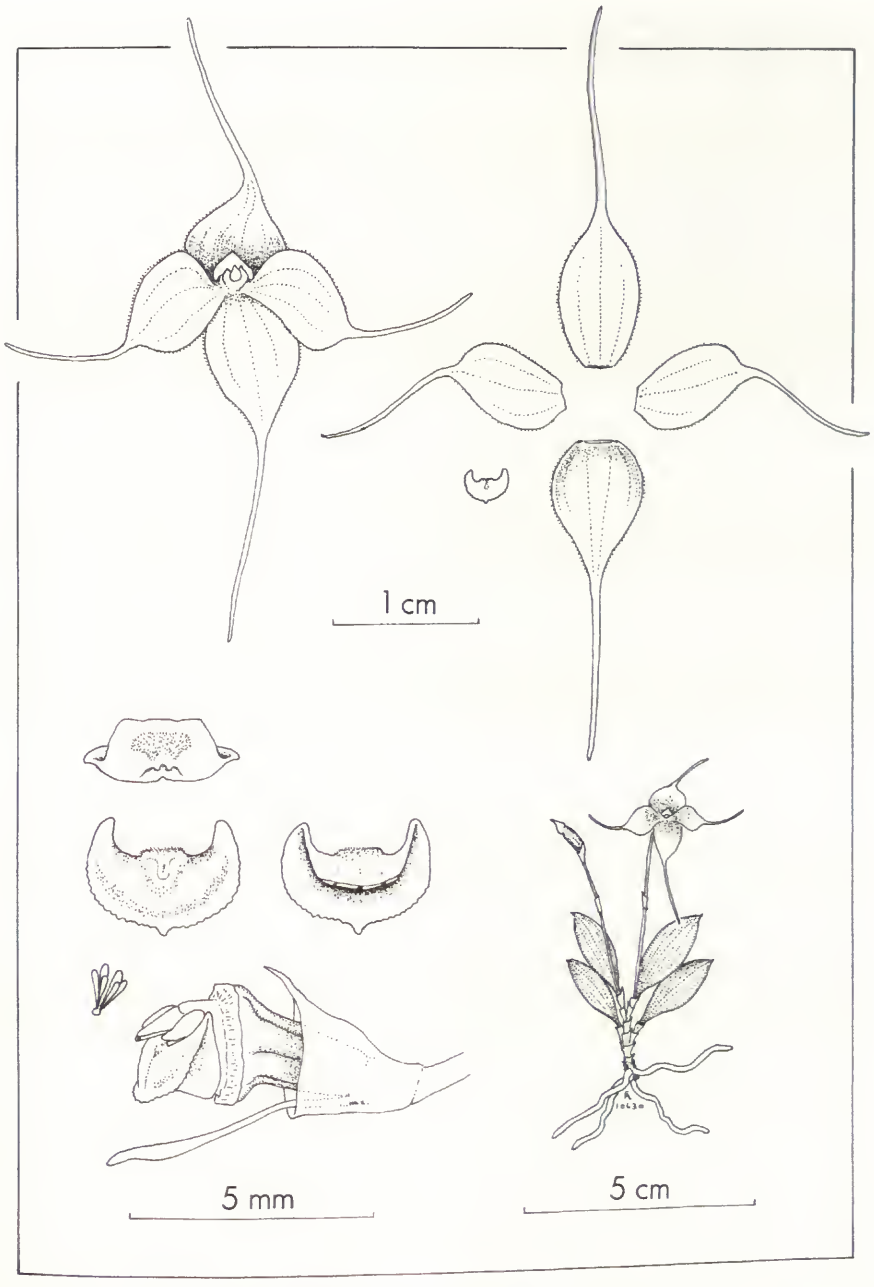


Plate 21. *Brachionidium folsomii* Dressler

Brachionidium fornicatum Luer & Hirtz, sp. nov.

Ety.: From the Latin *fornicautus*, "vaulted," referring to concave sepaline tube.

Planta grandis erecta, *B. parvifolii* (Lindl.) Lindl. similis, sed flore cupuliformi cum caudis brevibus, sepalo mediano plano suborbiculari, synsepalo superiore profunde concavo bicaudato, labello transverse cordato marginibus concavis.

Plant large, terrestrial, erect, up to 50 cm or more tall, the rhizome stout, branching, 2-5.5 cm long between ramicauls, with 2-3 distant, smooth, tubular sheaths, rooting from the base. Ramicauls suberect, 1-1.5 cm long, enclosed by 2 imbricating, mucronate sheaths. **Leaf** erect, coriaceous, 2.5-5 cm long including the 3-5 mm long petiole, the blade elliptical, acute, 1.2-1.5 cm wide, multiveined, the base cuneate into the petiole. **Inflorescence** a solitary, non-resupinate, yellow flower borne by an erect, slender peduncle 2.5-4 cm long, with a bract near the middle and at the base, from near the apex of the ramicaul; floral bract inflated, acute, 5-7 mm long, enclosing the pedicel and much of the ovary; pedicel 1-1.5 mm long, with a filament 5-7 mm long; ovary 4-5 mm long; **sepals** yellow, eciliate, the middle sepal flat, descending, broadly ovate to suborbicular, 15-18 mm long, 12-16 mm wide, 5-(7-)veined, the apex broadly obtuse, contracted into a slender, brown tail ca. 10 mm long, the lateral sepals connate into a deeply concave, ovoid synsepal, 20 mm long, 22 mm wide expanded, 8-veined, the apex obtuse, contracted into a pair of slender, erect, brown tails ca. 10 mm long; **petals** yellow, minutely short-ciliate, ovate, oblique, 11-15 mm long, the apex subacute, acuminate into a slender, deflexed, brown tail ca. 10 mm long; **lip** yellow, edged in brown, transversely ovate-cordate, 4 mm long, 6 mm wide, 2 mm deep, broadly rounded at the apex, minutely apiculate, the lateral angles obtuse, the margins with a broadly concave external to low. lunate calli, each terminated with a low callus near the middle, the disc with a flat, minutely pubescent callus with a glenion anteriorly; **column** stout, 3 mm long, 4 mm wide; pollinia 8.

ECUADOR: Prov. of Carchi: terrestrial near Playón de San Francisco, alt. 3300 m, 14 Feb. 1994, *A. Hirtz 6030* (Holotype: MO).
COLOMBIA: Dept of Nariño: cloud forest east of La Victoria, alt. 3000 m, 4 Nov. 1979, *C. Luer, J. Luer & A. Hirtz 4667* (SEL).

This species occurs among scrubby vegetation at high altitudes in northernmost Ecuador and adjacent southernmost Colombia. It is a free-standing species, occurring singly or in bush-like colonies a meter across. The branching rhizomes produce a short ramicaul with an elliptical leaf about three to five centimeters apart. The uppermost synsepal is concave with two tails short and erect. The middle sepal is flat and decurving, overlain at the base by the decurving petals. The transverse lip is similar to that of *B. parvifolium*, but it is distinguished by a low pair of central calli from the marginal, longitudinal calli.

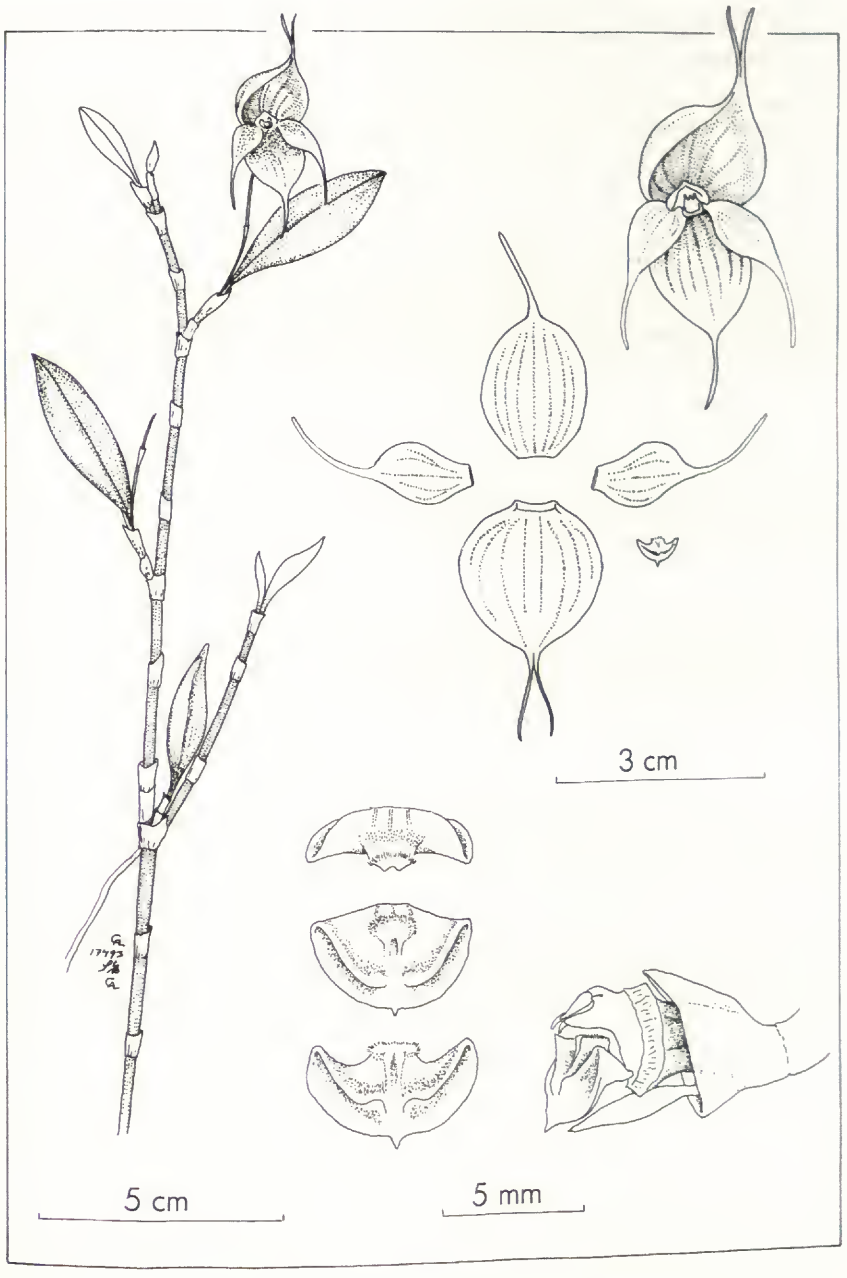


Plate 22. *Brachionidium fornicatum* Luer & Hirtz

Brachionidium furfuraceum Luer, sp. nov.

Ety.: From the Latin *furfuraceus*, "scurfy," referring to the scaly sheaths of the rhizomes.

Planta grandis erecta stricta rhizomate crasso ramoso vaginis valde furfuraceis, foliis anguste ellipticis acutis, flore grandi pulcherrimo, sepalo impari ovato acuminato, synsepalo grandi late ovato profunde concavo brevicaudato et labello late trapeziformi calloso obtuso apiculato.

Plant large, terrestrial, erect, up to 25 cm or more tall, the rhizome stout, branching, 1.5-2.5 cm long between ramicauls, enclosed by 3 scurfy, tubular sheaths, acute at the apex and lightly fimbriate along the lower margin; roots from the rhizome toward the base. Ramicauls stout, suberect, 9-11 mm long, enclosed by 2 similar, scurfy sheaths. **Leaf** erect, coriaceous, minutely denticulate above the middle, narrowly linear-elliptical, acute, 23-33 mm long including a petiole 1-2 mm long, 4-6 mm wide, longitudinally 7-veined. **Inflorescence** a solitary, showy, non-resupinate flower borne by a slender, erect peduncle 3.5-4.5 cm long, with a bract near the middle, and another at the base, from near the apex of the ramicaul; floral bract inflated, mucronate, 6 mm long, enclosing the pedicel and ovary; pedicel 1 mm long, with a filament 5 mm long; ovary 3 mm long; **sepals** maroon, eciliate, the middle sepal ovate, acute, acuminate, 21 mm long, 7 mm wide, 3-veined, the lateral sepals totally connate into a broadly ovate-suborbicular, obtuse, deeply concave synsepal, 18 mm long, 16 mm wide expanded, 4-veined, the apex contracted into a slender tail 4 mm long; **petals** maroon, eciliate, oblong, oblique, subacute, the blade 13 mm long, 6.5 mm wide, 3-veined, the apex acuminate into a filiform tail 9 mm long; **lip** purple, transversely trapeziform, 3 mm long, 4 mm wide, the lateral angles subacute, the apical margin broadly thickened, broadly rounded, shortly apiculate, the disc within ovoid, shortly pubescent callus wide, with a glenion; **column** stout, 2 mm long, pollinia unknown.

PERU: Dept. of Amazonas: Prov. of Bagua, Cordillera Colán southeast of La Peca, alt. 8000 ft., terrestrial in elfin bog, 25 Sept. 1978, *P. Barbour 3561* (Holotype: MO), C. Luer illustr. 14380.

This species, known from a single collection from northern Peru, is similar to *B. elegans* from southern Ecuador. The rhizomes of both species are stout and erect with scurfy sheaths. The leaves of *B. furfuraceum* are erect, considerably narrower and acute. Florally the two species are similar in size with a cucullate, short-tailed synsepal. The petals of *B. furfuraceum* are eciliate. The lip of *B. furfuraceum* is nearly as long as broad with narrow, marginal surfaces. The callus at the base is low. The lip of *B. elegans* is considerably broader than long with broad, marginal surfaces. The callus at the base is high.

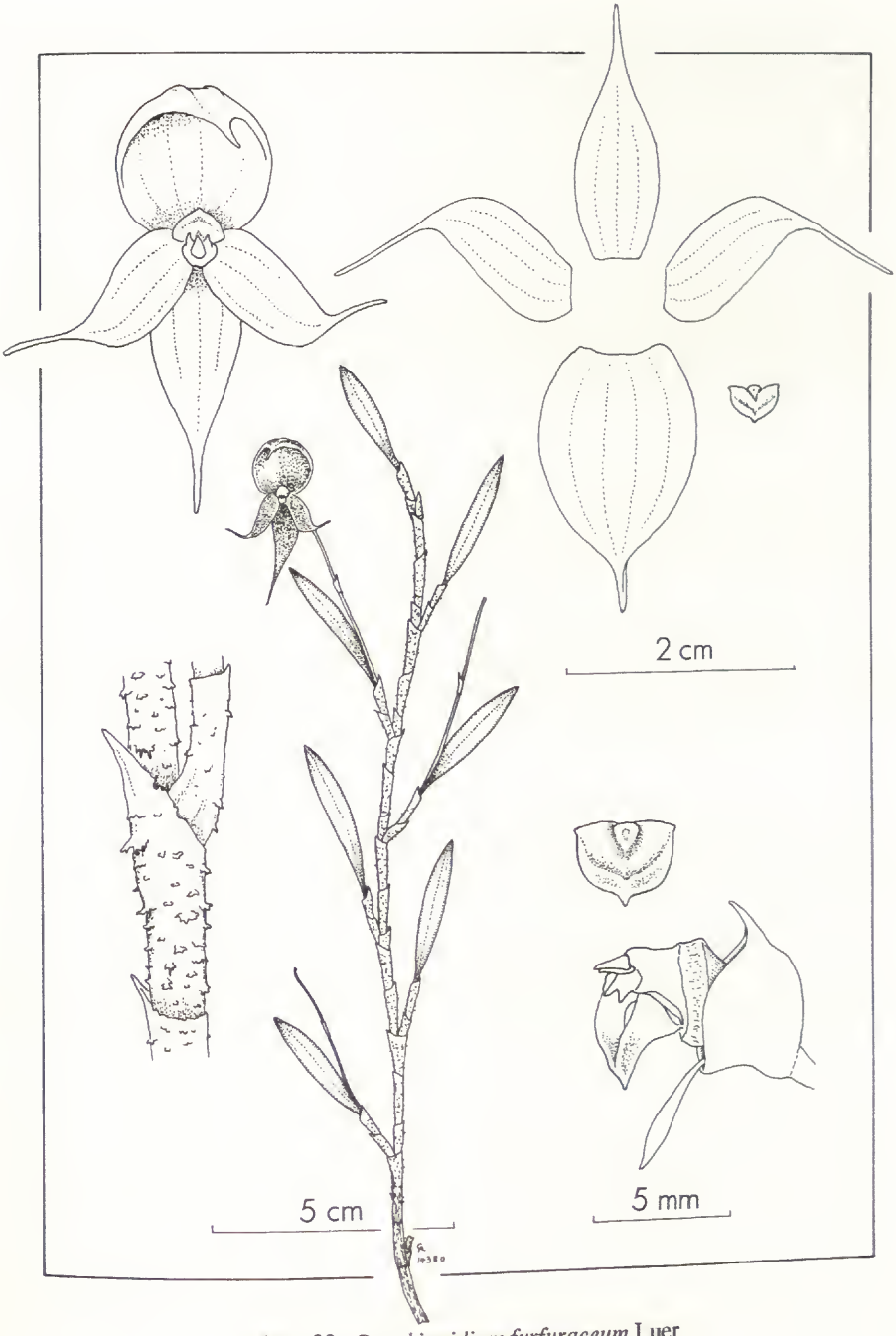


Plate 23. *Brachionidium furfuraceum* Luer

Brachionidium galeatum Luer & Hirtz, sp. nov.

Ety.: From the Latin *galeatus*, "with a helmet," referring to the concave synsepal.

Planta mediocris erecta rhizomate crasso elongato vaginis furfuraceis, folio elliptico carnoso rugoso-verrucoso, sepalis purpureis minute ciliatis, sepalo impari elliptico acuto, synsepalo lato profunde concavo, petalis ovatis obliquis acuminatis minute ciliatis, labello transverse ovato, angulis lateralibus acutis, apice rotundato apiculato, disco bicarinato verruculoso cum callo pubescenti ad centrum.

Plant medium in size, terrestrial, suberect to erect, up to 20 cm tall, the rhizomes relatively stout, sometimes branching, 5-12 mm long between ramicauls, with 3 loose, scurfy, long-mucronate sheaths, subfimbriate on the lower margins; roots coarse, produced from nodes near the base. Ramicauls suberect, slender, 3-5 mm long, enclosed by 2 tubular, mucronate sheaths. **Leaf** erect to suberect, thickly coriaceous, fleshy, denticulate above the middle, elliptical, subacute, apiculate, 10-14 mm long, 4-5 mm wide, with 7 prominent, coarsely rugose-verrucose veins, the base contracted into a petiole 1 mm long. **Inflorescence** a solitary, purple, non-resupinate flower borne by an erect, slender peduncle 13-20 mm long, with a mucronate bract near the middle and another at the base; floral bract, smooth, 2.5 mm long, long-mucronate, enclosing the pedicel and much of the ovary; pedicels thick, 0.5 mm long, with a protruding filament 3 mm long; ovary 2 mm long; **sepals** minutely short-ciliate, the middle sepal ovate, acute, slightly acuminate, 8-11 mm long, 3-6 mm wide, 3-veined, the lateral sepals completely connate into a suborbicular, deeply concave synsepal, 9-12 mm long, 5-10 mm wide, 6-13 mm wide expanded, 4-veined, the apex abruptly short-acuminate; **petals** minutely short-ciliate, ovate, oblique, acute, long-acuminate, 7.5-11 mm long, 2-3 mm wide, 3-veined; **lip** transversely ovate, 1.75 mm long, 3 mm wide, with acute lateral angles, the apex rounded, apiculate, with lightly verrucose submarginal calli, the disc with a central, elevated, flattened, pubescent callus, the broad base hinged to the column-foot; **column** stout, 1 mm long, bidentate; pollinia 8.

ECUADOR: Prov. of Morona-Santiago: terrestrial in cloud forest east of Gualaceo, alt. 2150 m, 16 May 1988, *C. Luer, A. Hirtz, W. Flores, A. Andreetta & W. Teague 13398* (Holotype: MO); Cordillera del Condor, east of Chuchumbletza, alt. 1750 m, 21 May 1988, *C. Luer, A. Hirtz, W. Flores, A. Andreetta & W. Teague 13565* (MO).

This species is apparently endemic in southeastern Ecuador. It is distinguished by the erect rhizome with scurfy sheaths and furrowed-rugose leaves. In habit it is similar to *B. rugosum* from a much higher altitude also in southeastern Ecuador. Both species are characterized by the small, erect habit with small, rugose leaves, but the rhizome of *B. galeatum* is stouter with scurfy sheaths.

The small, purple, tailless flowers of *B. galeatum*, are distinguished by the cucullate synsepal that is uppermost in the flower. It is proportionately large and deeply concave. The petals are relatively narrow and acuminate.The lip is transversely ovate with a pair of submarginal carinae on the front surface.

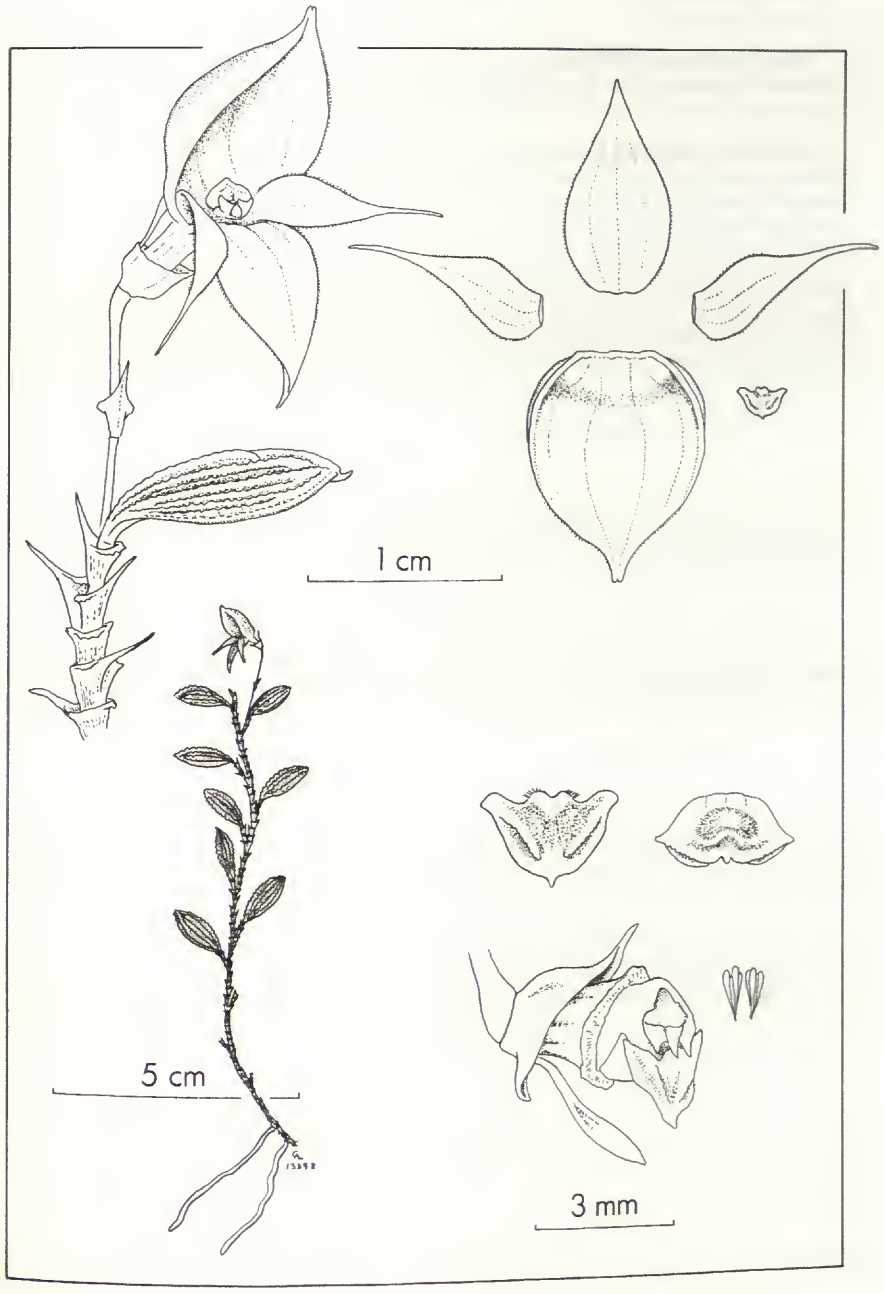


Plate 24. *Brachionidium galeatum* Luer & Hirtz

Brachionidium haberi Luer, sp. nov.

Ety.: Named in honor of William A. Haber, researcher of the Missouri Botanical Garden, who discovered this species.

Planta grandis erecta rhizomate crasso vaginis glabris, foliis ellipticis, flore atropurpureo, sepalis ovatis obtusis caudatis, petalis ovatis obliquis minute ciliatis, labello transverse cordato, lobis basalibus acutis incurvis, apice late rotundo denticulato apiculato, callo suborbiculari pubescenti.

Plant large, epiphytic or terrestrial in loose moss, erect to suberect, up to 30 cm tall, the rhizome relatively stout, occasionally branching, 8-10 mm long between ramicauls, enclosed by 2-3 tubular, mucronate sheaths; roots coarse from near the base. Ramicauls slender, suberect, 7-9 mm long, enclosed by 2 tubular, mucronate sheaths. **Leaf** erect or suberect, coriaceous, elliptical, acute, 25-35 mm long including a petiole 2-3 mm long, 7-10 mm wide, 9- to 13-veined. **Inflorescence** a solitary, non-resupinate flower borne by a slender, erect peduncle 20-25 mm long, with a bract near the middle, from near the apex of the ramicaul; floral bract inflated, acute, mucronate, 5 mm long, enclosing the pedicel and part of the ovary; pedicel 2 mm long, with a filament 7 mm long; ovary 4 mm long; **sepals** dark purple, microscopically ciliate, the middle sepal suborbicular, concave, 10 mm long, 8 mm wide, 3-veined, the apex obtuse to rounded, contracted into a tail 2-5 mm long, the lateral sepals connate into an ovate, concave synsepal, 10 mm 8 mm wide, 4-veined, the apex obtuse, contracted into a slender tail 8 mm long, with the tips free for 3 mm; **petals** dark purple, minutely ciliate, ovate, oblique, subacute, the blade 8 mm long, 6 mm wide, 3-veined, the tail 5 mm long; **lip** purple, transversely cordate, 3 mm long, 5 mm wide, the basal angles subacute, incurved, the middle lobe broadly rounded, denticulate, apiculate, thickened behind the margin, the disc with a flat, ovate, pubescent callus; **column** stout, 1 mm long, pollinia 6.

COSTA RICA: Prov. of Puntarenas: Veracruz river valley and ridges south of the Monteverde Reserve, Pacific slope, wet forest, alt. 1600 m, 29 Apr. 1986, *W. A. Haber, E. Bello & L. Lierheimer 4485* (Holotype: MO), C. Luer illustr. 14379. Same locality, date and collectors, *W. Haber 4489* (MO); Monteverde, Cerro Ojo de Agua, alt. 1700-1800 m, 22-23 Apr. 1987, *W. Haber & E. Bello 7027, 7076* (CR, MO).

This species is apparently endemic in wet cloud forests near and within the Monteverde Preserve in Costa Rica where it is sometimes found to be locally abundant. Although vegetatively considerably larger, *B. haberi* is similar to *B. folsomii*.

Brachionidium haberi is distinguished by large, erect habit and relatively large floral parts with comparatively short, slender tails. The lip is large, thick, transversely cordate with a minutely denticulate margin as in *B. folsomii*.

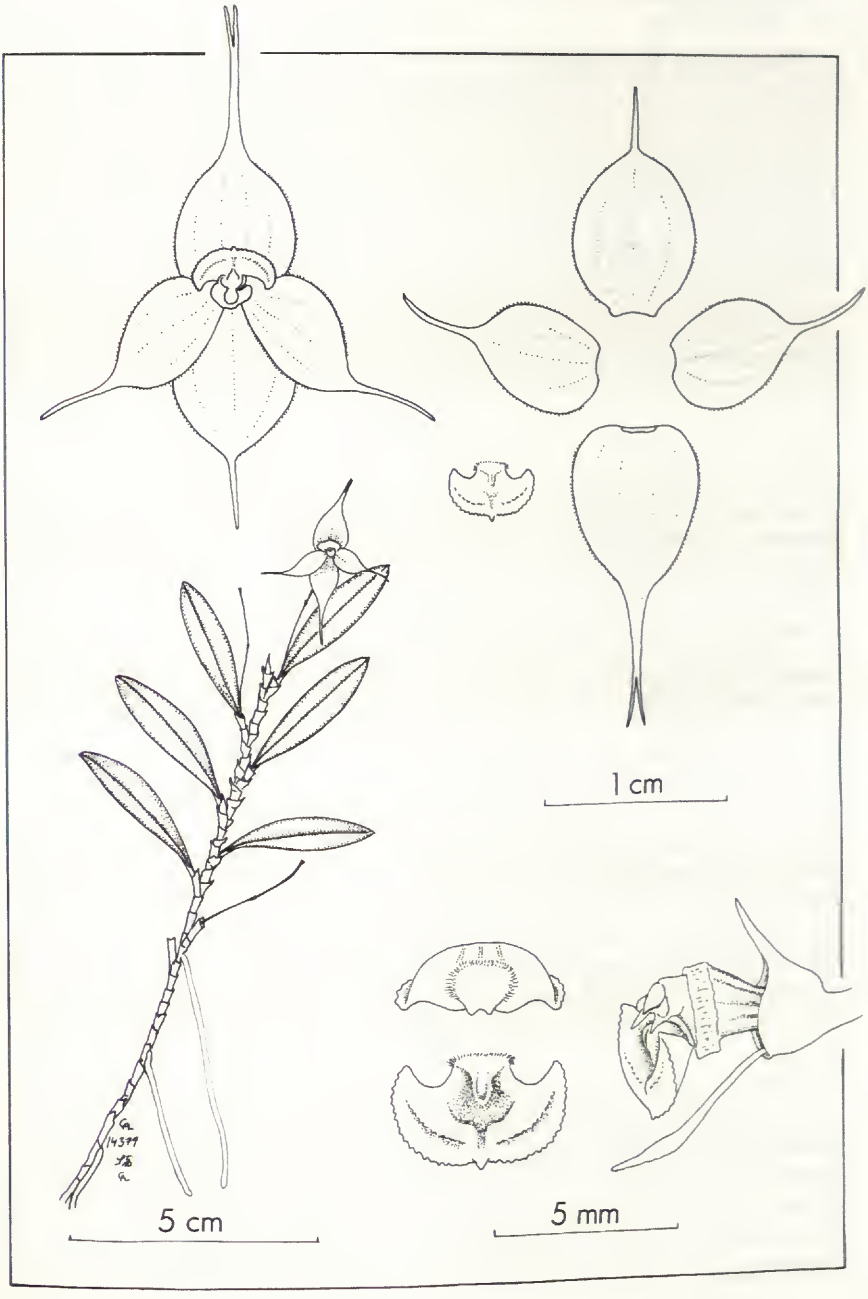


Plate 25. *Brachionidium haberi* Luer

Brachionidium hirtzii Luer, Lindleyana 1: 174, 1986.

Ety.: Named in honor of Alexander C. Hirtz of Quito, Ecuador, who was the first to discover this species in flower.

Plant medium in size to large, terrestrial to epiphytic, long-repent, with branches up to 50 cm long, the rhizomes slender, 15-25 mm long between ramicauls, enclosed by 3 thin, loosely fitting, mucronate sheaths; roots slender, produced singly from nodes. Ramicauls suberect, 4-6 mm long, enclosed by 2 similar, imbricating sheaths. **Leaf** suberect, thinly coriaceous, broadly elliptical to suborbicular, subacute to obtuse, 20-33 mm long with a petiole 2-3 mm long, 10-25 mm wide, 7- to 15-veined, the base cuneate into the petiole. **Inflorescence** a large, showy, solitary, non-resupinate, purple or yellow flower, borne by a suberect peduncle 17-23 mm long, with a bract near the middle and at the base, from near the apex of the ramicaul; floral bract inflated, mucronate, 3-4 mm long; pedicel 0.5 mm long, with a filament 5 mm long; ovary 2 mm long; **sepals** translucent, shortly ciliate, the middle sepal ovate, acute, acuminate, 25-35 mm long including the tail 12-24 mm long, 6 mm wide, 3-veined, the lateral sepals completely connate into a triangular-ovate, acute, acuminate lamina 25-35 mm long including the tail 12-24 mm long, 6 mm wide, 4-veined; **petals** shortly ciliate, ovate, oblique, acute, acuminate, 26-30 mm long including the tail 13-20 mm long, 4 mm wide, 3-veined; **lip** transversely ovate, 3.25 mm long, 4.5 mm wide, the lateral angles subacute, incurved, the apex obtuse with bimarginate-callous margins, the disc with a flat, shortly pubescent callus with a well-developed glenion; **column** stout, 2 mm long; pollinia 6.

ECUADOR: Prov. of Loja: epiphytic in cloud forest, Cajanuma Range south of Loja, alt. 2750 m, 21 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10748* (Holotype: MO); Parque Nacional Podocarpus, wet montane forest, alt. 2850-2950 m, 21 Feb. 1985, *B. Øllgaard et al. 57804, 57817* (AAU, QCA); same locality, alt. 2700-2900 m, 24 Mar. 1989, *D. E. Christensen 88037* (AAU); same locality, 2 Mar. 1990, *D. E. Christensen 88154, 88177* (AAU); east of Nudo de Cajanuma, alt. 2900 m, 31 Jan. 1989, *J. E. Madsen 85751* (AAU, QCA); above Nudo de Cajanuma, alt. 2900-3000 m, 23 Feb. 1989, *J. E. Madsen 85811* (AAU, QCA).

This species has been known to exist in the mountains south of Loja for years, but it had not been found with flowers until 1985. Plants often grow in moss and humus on the dark forest floor, apparently rarely flowering, but when plants climb higher in the trees where there is more light and circulation of air, flowering is not infrequent. The color of the translucent sepals and petals is either purple or yellow.

Among the numerous related species, *B. hirtzii* is most similar to the smaller *B. phalangiferum* from western Venezuela and eastern Colombia. Both species are characterized by a climbing habit with smooth, apiculate sheaths, and evenly spaced, elliptical leaves. The sepals and petals are minutely ciliate and long-caudate. Most distinguishing is the evenly bimarginate lip of *B. hirtzii* as compared to the bimarginate lip of *B. phalangiferum* in which the upper margin overhangs the lower margin.

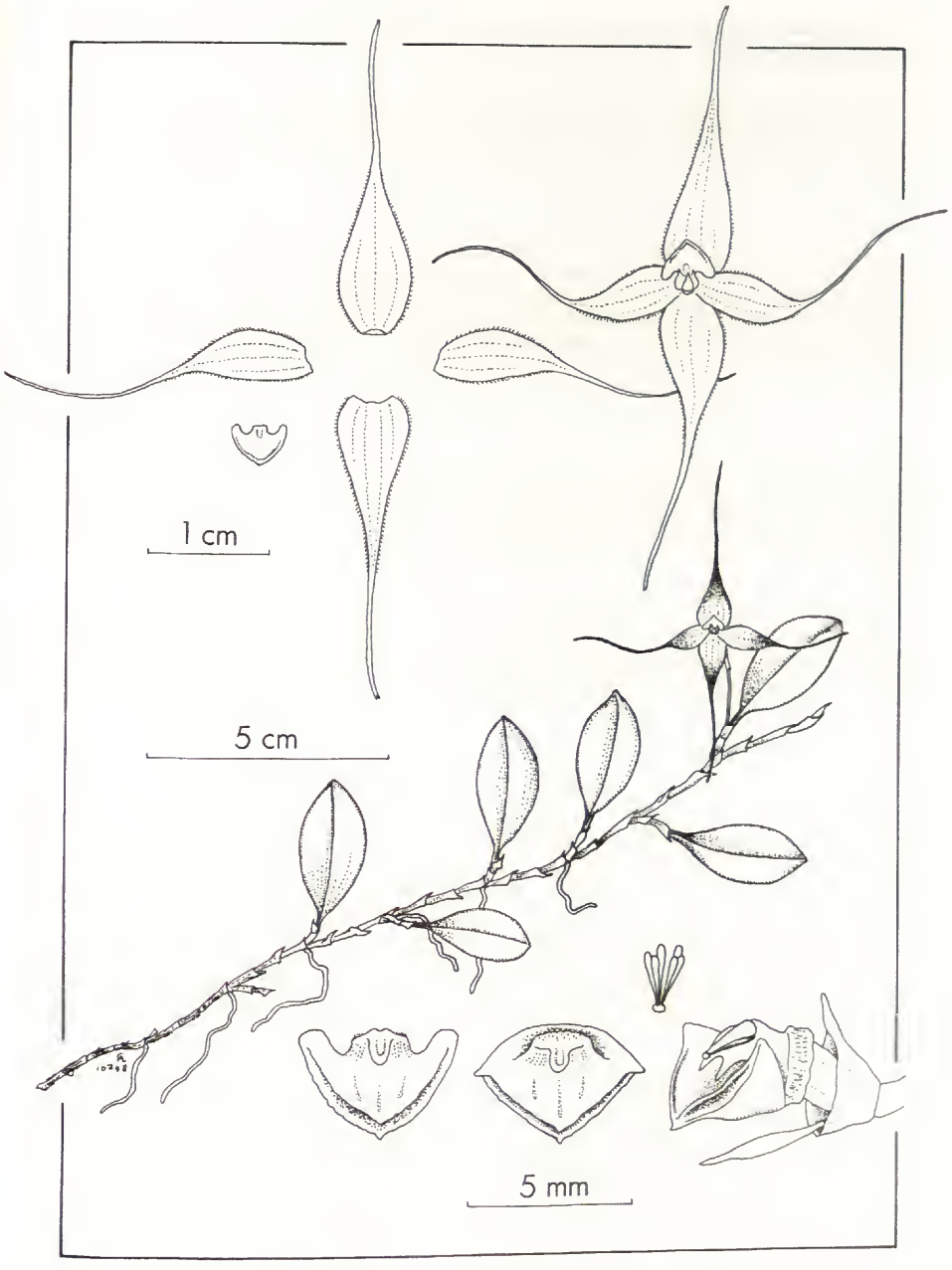


Plate 26. *Brachionidium hirtzii* Luer

Brachionidium imperiale Luer & Escobar, sp. nov.

Ety.: From the Latin *imperialis*, "imperial," referring to the regal appearance of the flower.

Species haec *B. parvifolii* (Lindl.) Lindl. persimilis, sed foliis majoribus et sepalis longissime caudatis multinervatisque differt.

Plant large, terrestrial to epiphytic in shrubs, ascending, erect, up to 1 meter tall, the rhizome slender to stout, branching, 2-5 cm long between ramicauls, each segment with 2-3 distant, smooth, tubular, mucronate sheaths, rooting from the base. Ramicauls suberect, 0.5-1 cm long, enclosed by 2 similar, imbricating sheaths. **Leaf** erect, coriaceous, 3-6.5 cm long including the 3-6 mm long petiole, the blade elliptical, acute, 1.5-2.8 cm wide, multiveined, the base cuneate into the petiole. **Inflorescence** a large, showy, solitary, non-resupinate, bright purple flower borne by an erect, slender peduncle 4-6.5 cm long, with a bract near the middle and at the base, from near the apex of the ramicaul; floral bract inflated, mucronate, 6-8 mm long, enclosing the pedicel and part of the ovary; pedicel 1.5 mm long, with a filament 5 mm long; ovary 4-5 mm long; **sepals** bright purple, eciliate, the middle sepal ovate, acute, acuminate, long-caudate, 45-95 mm long including the tail, 12-16 mm wide, 11-veined (the veins incomplete when more than 7), the lateral sepals connate into an ovate-triangular, acute, acuminate, long-caudate synsepal, 45-95 mm long including the tails, 12-14 mm wide, 10-veined, the tail bifid for 20-30 mm; **petals** minutely short-ciliate, ovate, oblique, acute, acuminate, long-caudate, 45-90 mm long including the tail, 9-11 mm wide, 5- to 7-veined; **lip** brown, cordate-triangular, obtuse, minutely apiculate, 5 mm long, 5 mm wide, the lateral angles erect, acute, with the margins longitudinally concave extemal to an intramarginal callus, the disc with a flat, pubescent callus with a glenion anteriorly; **column** stout, 3-4 mm long, 6 mm wide, with 8 pollinia.

COLOMBIA: Dept. of Valle del Cauca: Alto de Los Galápagos, alt. 2050 m, 13 May 1993, *C. Luer, J. Luer, R. Escobar, A. De Wilde & J. Julián 16799* (Holotype: MO); Munic. of El Cairo, Cerro del Inglés, Serranía de los Paraguas, alt. 2400 m, 28 Dec. 1986, *F. Silverstone-Sopkin, N. Paz, R. González, I. Cabrera & D. Garcés 2666* (CUVC, MO); same data, *F. A. Silverstone-Sopkin et al. 2812* (CUVC, MO). Dept. of Chocó: Carmen de Atrató, alt. 2000 m, 2 Mar. 1944, *F. R. Fosberg & E. L. Core 21522* (US); Munic. of San José del Palmar, Cerro del Torrá, alt. ca. 1970 m, 9 Jan. 1984, *F. Silverstone-Sopkin, N. Paz, A. Duque & H. Bayona 1662* (CUVC, MO); epiphytic along a branch of Río Negro between el Helipuerto and the cerro, alt. 2000 m, 31 Aug. 1988, *J. E. Ramos, P. Silverstone et al. 1685* (COL, MO), C. Luer illustr. 14811. Dept. of Risaralda: Pueblo Rico, south of Pueblo Rico along new TV road, alt. 2400, 14 May 1993, *C. Luer, J. Luer, A. De Wilde & J. Julián 16827* (MO).
ECUADOR: Prov. of Pastaza: epiphytic in cloud forest along Río Zuñag, alt. 2600 m, 24 Feb. 1990, *A. Hirtz, S. Dalström et al. 4633* (Holotype: MO), C. Luer illustr. 17492; same collection data, *S. Dalström et al. 1410* (MO).

This magnificent species is found at altitudes around 2000 meters above sea-level from central Colombia to central Ecuador. The first known collection was by Fosberg and Core in 1944. *Brachionidium imperiale* is similar to *B. parvifolium* with which it shares distribution, but at higher altitudes around 3000 meters above sea-level.

In habit, the two species are similar except that most leaves of *B. imperiale* are considerably larger. Although the flowers are superficially similar, the sepals and petals of *B. imperiale* are multiveined and with filamentous tails twice or thrice longer. The lips are very similar with minor variations found in both species.

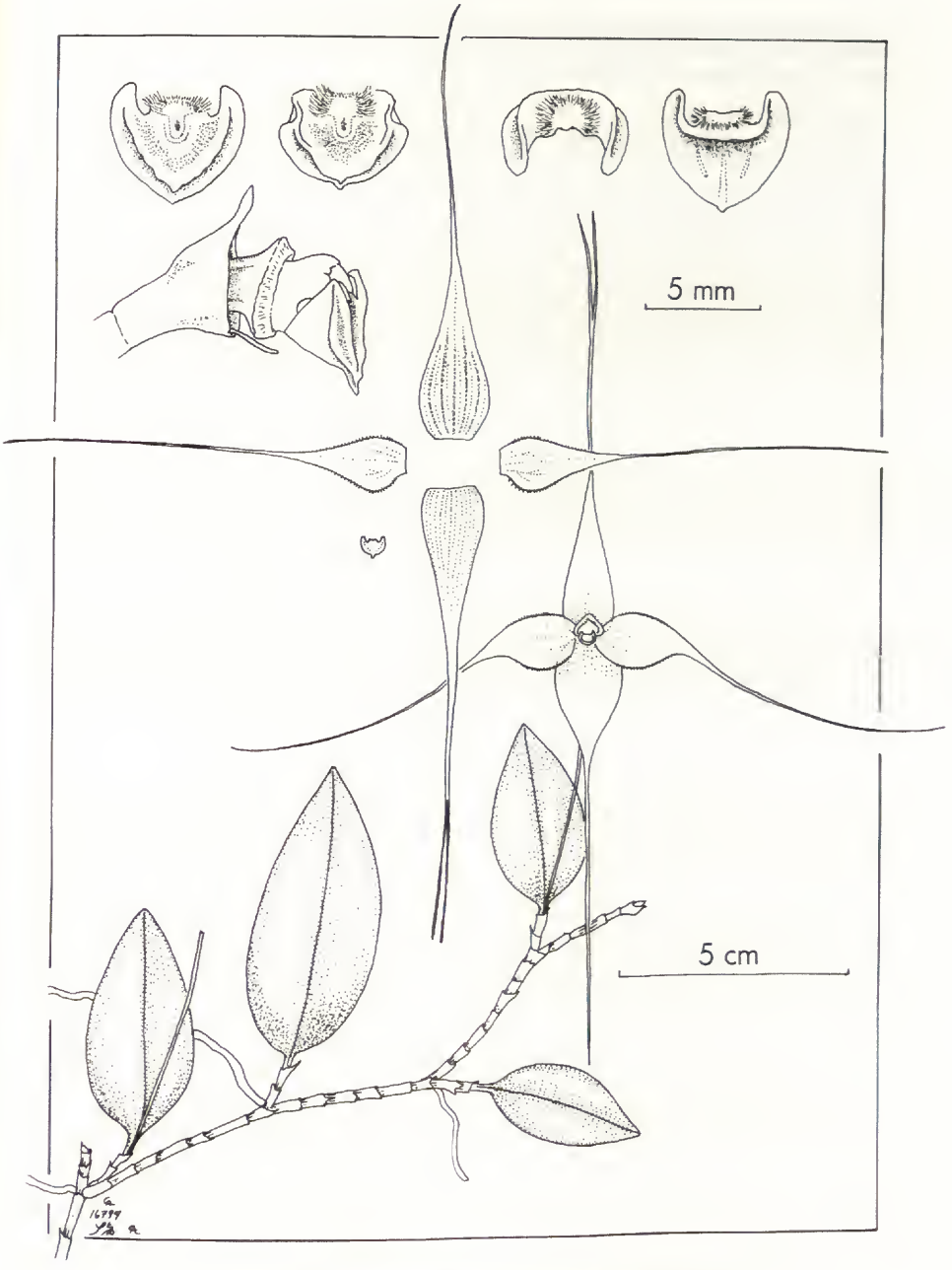


Plate 27. *Brachionidium imperiale* Luer & Escobar

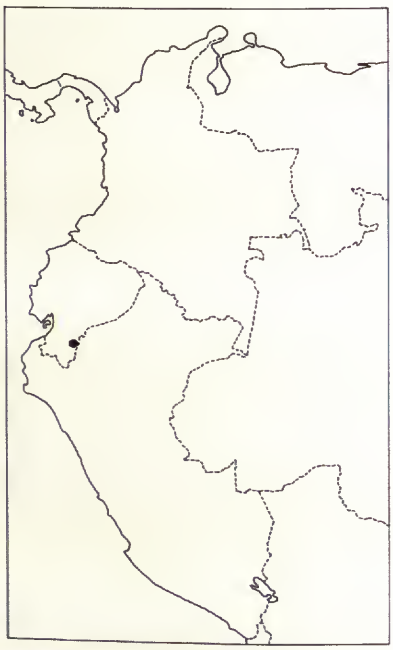
Brachionidium jesupiae Luer, sp. nov.

Ety.: Named in honor of Ann Lauer Jesup of Bristol, Ct., who discovered this species.

Planta perparva longirepens rhizomate gracili elongato, pedunculo gracili folio elliptico leviter longiore, sepalis petalisque translucentibus eciliatis longicaudatis, labello transverse ovato, angulis lateralibus acutis, apice obtuso apiculato, marginibus canaliculatis.

Plant very small, epiphytic, repent, the rhizomes slender, occasionally branching, 10-13 mm long between ramicauls, with 3 closely fitting sheaths, each 1 mm long; root solitary from nodes, comparatively coarse. Ramicauls suberect, slender, 0.5-1 mm long, enclosed by 2 tubular sheaths. **Leaf** erect to suberect, coriaceous, elliptical, 5-7.5 mm long, 3.5-4 mm wide, 5-veined, the apex subacute with an apiculum, the base cuneate into a petiole 0.5-1 mm long. **Inflorescence** a solitary, light yellow-green, non-resupinate flower borne by an erect, slender peduncle 11-14 mm long, with a bract near the middle and at the base; floral bract, smooth, 3 mm long, enclosing pedicel and ovary; pedicels thick, 0.5 mm long, with a protruding filament 2.5 mm long; ovary 1 mm long; **sepals** eciliate, the middle sepal ovate, acute, acuminate, long-caudate, 15 mm long including the filiform tail 10 mm long, 2.75 mm wide near the base, 3-veined, the lateral sepals completely connate into a narrowly triangular, acute, long-attenuate synsepal 11 mm long, 2 mm wide, 2-veined; **petals** eciliate, ovate, oblique, acute, acuminate, long-caudate, 13 mm long including the filiform tail 8 mm long, 2 mm wide, 3-veined; **lip** transversely ovate, 1.5 mm long, 2 mm wide, with acute lateral angles, the apex rounded, abruptly apiculate, with marginal calli, the disc with a central, flattened, ovoid callus, ciliate on the sides, with a glenion, the broad base hinged to the column-foot; **column** stout, 1 mm long, bidentate; pollinia 8.

ECUADOR: Prov. of Zamora-Chinchipe: Cordillera del Condor, epiphytic on mossy tree trunk in cloud forest east of Los Encuentros, alt. 1650 m, 21 Jan. 1989, *C. Luer, J. Luer, & P. Jesup & A. Jesup 14037* (Holotype: MO).



This very small species was found growing hidden in deep moss on a fallen tree trunk in the Cordillera del Condor by Ann Jesup. It is not known from any other collection, but it is closely allied to *B. capillare*. Both species have been successfully cultivated in Bristol, Connecticut, where a profusion of flowers often covers the dense mass of plants that overflow the pot.

Brachionidium jesupiae is identified by the minute, long-creeping habit with tiny, elliptical, apiculate leaves, and small, very long-tailed, non-ciliate, yellow-green flowers. The margin of the transverse lip is conspicuously channeled along the margins. The leaves of *B. capillare* are round, and the margin of the lip is entire. Both species posses eight pollinia.

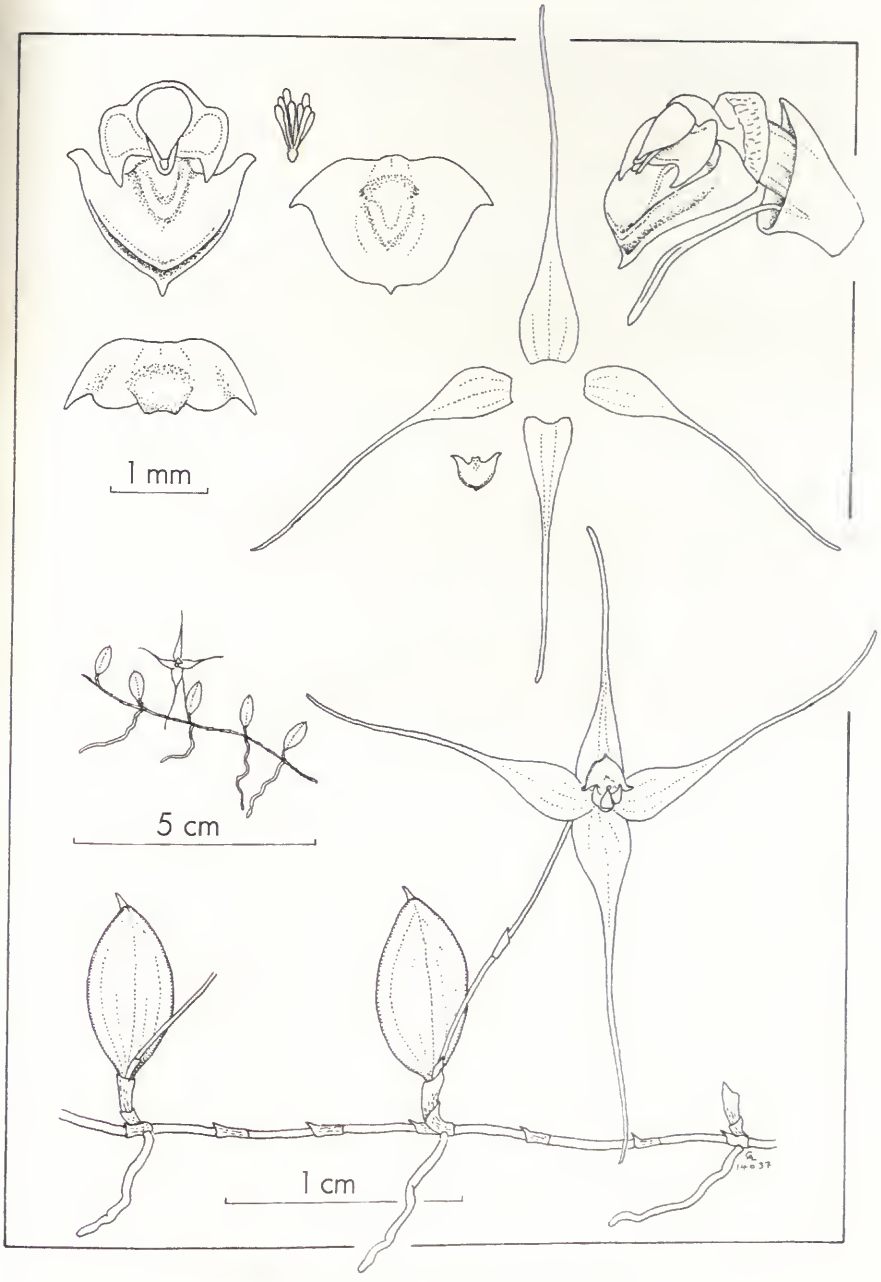


Plate 28. *Brachionidium jesupiae* Luer

Brachionidium julianii Carnevali & Ramírez, Ernstia 39: 6, 1986.

Ety.: Named in honor of the late Dr. Julian Steyermark of the Missouri Botanical Garden, who collected this species.

Plant very small, suberect to erect, up to 2 cm tall, the rhizomes stout, erect, 1 mm long between ramicauls, enclosed by 2 imbricating, ribbed sheaths; roots slender from nodes near the base. Ramicauls suberect, 3-4 mm long, enclosed by 2 acuminate sheaths. **Leaf** erect to suberect, coriaceous, elliptical, acute, apiculate, 10-12 mm long including the petiole ca. 1 mm long, 4-5 mm wide, 5-(7-)veined, cuneate below into the petiole. **Inflorescence** a solitary, pale green flower borne by an erect, comparatively stout peduncle 7 mm long, with a bract near the middle; floral bract mucronate, 3 mm long; pedicel 0.5 mm long; ovary 1.5 mm long; **sepals** membranous, microscopically ciliate, the middle sepal elliptical, 6 mm long, 4 mm wide, 3-veined, the apex subacute, contracted into a slender tail 12 mm long, the lateral sepals connate into an ovate, acute synsepal, the blade 7 mm long, 5 mm wide, 4-veined, the apex contracted into a slender tail 10 mm long, the tip bifid for about 1 mm; **petals** microscopically ciliate, ovate, oblique, acute, the blade 6 mm long, 3.5 mm wide, 3-veined, contracted into a slender tail 10 mm long; **lip** ovoid, 2 mm long, 2 mm wide, with obtuse lateral angles, the apex broadly rounded, bimarginate, with the margins minutely denticulate, the disc with a central, rounded callus, the base hinged to the column-foot; **column** stout, ca. 1 mm long.
pollinia unknown.

VENEZUELA: Terr. Fed. Amazonas: Atabapo, Cerro Marahuaca, alt. 2560 m, 10-12 Oct. 1983, *J. A. Steyermark 129512* (Holotype: VEN).

This little species, one of many thousands collected by Dr. Julian Steyermark, was discovered in a remote region of eastern Venezuela. It is distinguished by the minute, suberect habit with peduncles about seven millimeters long that bear a small, but proportionately large flower. The sepals are microscopically ciliate and long-tailed. Although poorly preserved, the lip of the only flower appears to have a denticulate, double margin.

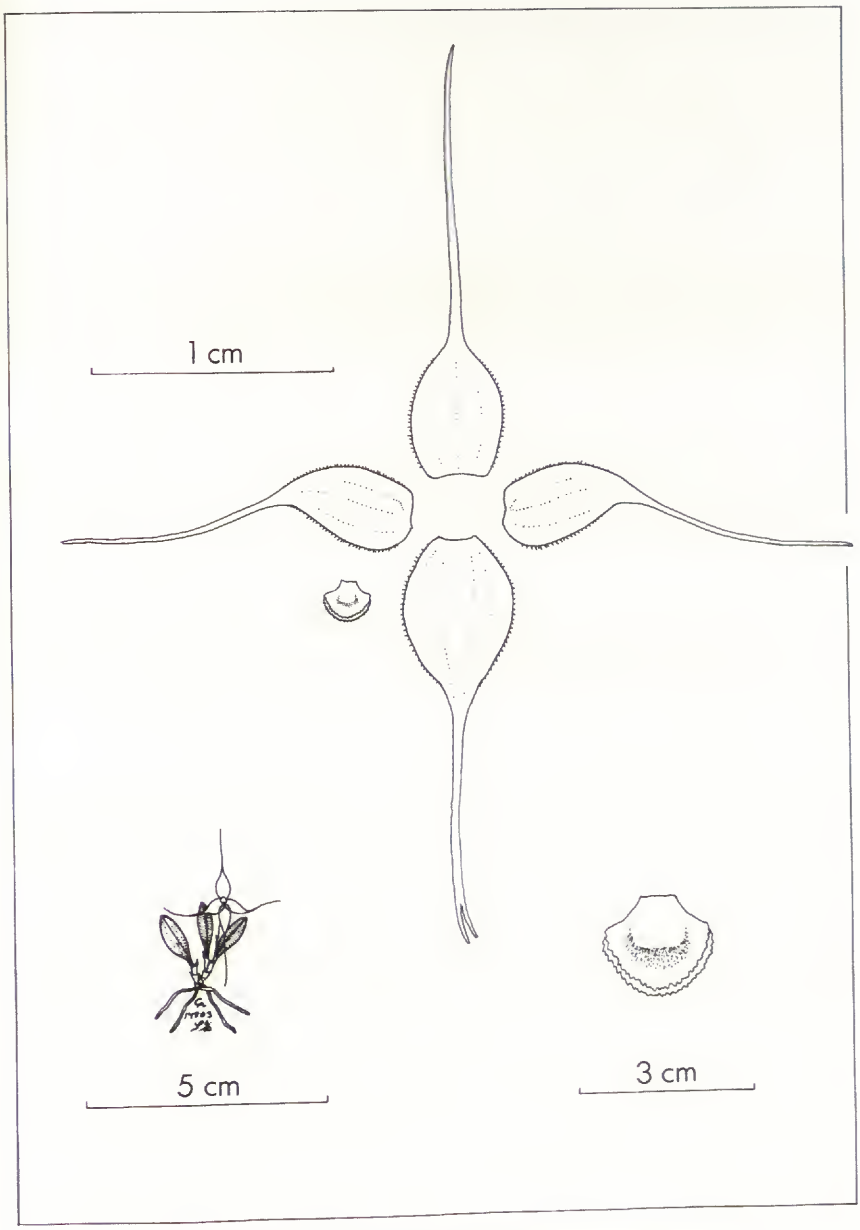


Plate 29. *Brachionidium julianii* Carnevali & Ramírez

Brachionidium kuhniarum Dressler, Orquideología 15: 157, 1982.
Ety.: Named in honor Janet and Helen Kuhn who discovered this species.

Plant small, epiphytic, the rhizome erect, sometimes branching, up to 10 cm tall, 5-8 mm long between ramicauls, enclosed by 3 loose, loosely fitting, mucronate sheaths; roots slender, from the base. Ramicauls suberect, 3-5 mm long, enclosed by 2 similar, imbricating sheaths. **Leaf** suberect, coriaceous, elliptical, subacute, apiculate, 7-15 mm long with a petiole 0.5-2 mm long, 4-11 mm wide, 7- to 9-veined, the base cuneate. **Inflorescence** a solitary, non-resupinate, yellow flower, borne by an erect peduncle 7-17 mm long, with a bract near the middle and at the base, from near the apex of the ramicaul; floral bract infundibular, mucronate, 3-4 mm long, enclosing the pedicel and ovary; pedicel 0.5 mm long, with a filament 3 mm long; ovary 2 mm long; **sepals** minutely short-ciliate, translucent, the middle sepal ovate, obtuse, acuminate, long-caudate, 11-12 mm long including the slender tail 5 mm long, 4-4.4 mm wide, 3-veined; lateral sepals completely connate into a deeply concave, ovate-suborbicular, long-caudate synsepal 10-11 mm long including the tail 5 mm long, 5 mm wide unexpanded, 4-veined, the apex obtuse, contracted into the slender tail, minutely bifid at the tip; **petals** minutely ciliate, ovate, oblique, acute, acuminate, 9 mm long including the tail 3 mm long, 3 mm wide, 3-veined; **lip** transversely obcordate, 2 mm long, 3.25 mm wide, the lateral angles obtuse to rounded, the apex broadly truncate, shortly apiculate, lightly concave above the middle, the margins microscopically erose, the disc with a low, flat, triangular, shortly pubescent callus with a small glenion; **column** stout, 1 mm long; pollinia 8, 2 pairs of which are connate at the apex.

PANAMA: Prov. of Coclé: Alto del Calvario, north of Aserradero El Copé, alt. 800 m, 5 Jan. 1980, *R. L. Dressler 5858* (Holotype: US; Isotype MO); same area, alt. 900 m, 19 Feb. 1985, *C. Luer, J. Luer, R. Dressler & K. Dressler 10631* (MO).
ECUADOR: Prov. of Napo: epiphytic on the eastern slope of Volcán Reventador, alt. 1850 m, 8 Feb. 1986, *C. Luer, J. Luer, A. Hirtz, W. Flores & A. Embree 11710* (MO).

This species was discovered growing on a fallen log in central Panama in 1980 by Janet Kuhn with her daughter Helen and Robert Dressler. Plants in flower were found still growing there five years later. Since the log is gradually deteriorating, Dressler has been moving individual plants onto suitable trunks of nearby living trees.

Brachionidium kuhniarum is recognized by the short, erect, leafy rhizome and a long-tailed, yellow flower with a cucullate synsepal. The sepals and petals are minutely ciliate. Most unusual are the eight pollinia in the pollinarium, with one pair on each side united at the rounded ends. The remaining pair on each side consists of a large and a small pollinium. Identical plants, including identical pollinaria, have subsequently been found by Hirtz in the oriente of Ecuador on the eastern flank of Volcán Reventador.

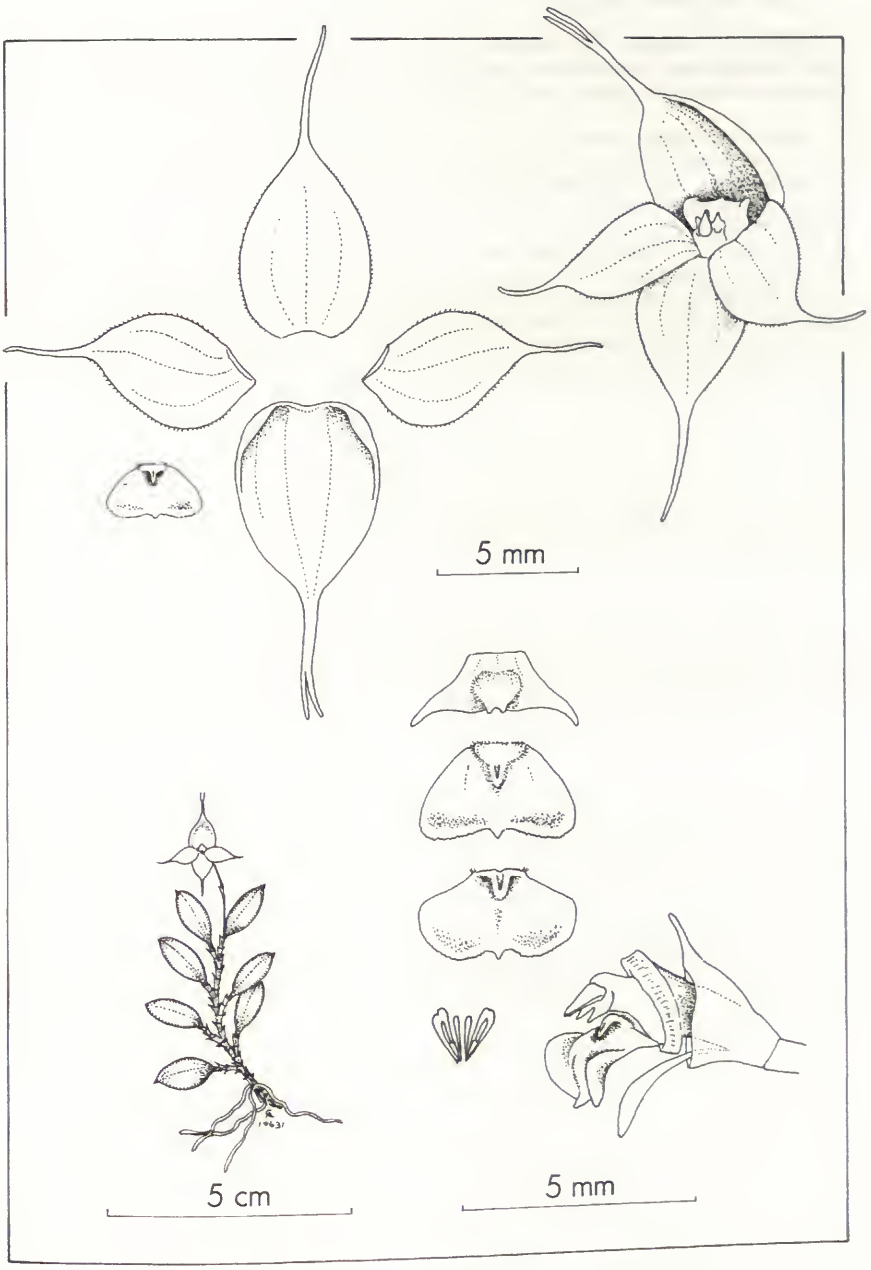


Plate 30. *Brachionidium kuhniarum* Dressler

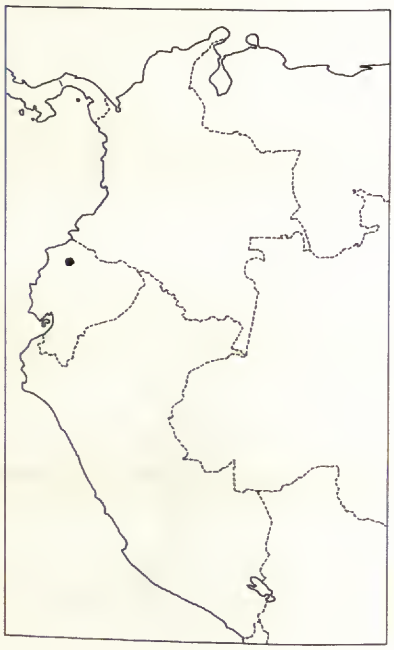
Brachionidium lehmannii Luer, sp. nov.

Ety.: Named in honor of F. C. Lehmann, German Consul, mining engineer, and renowned orchidologist, who discovered this species.

Planta parva rhizomate erecto vel suberecto, pedunculo foliis ellipticis quinque-nervatis multilongiore, flore parvo luteo, sepalo mediano synsepalo petalisque ciliatis longicaudatis, labello perparvo transverse ovato apiculato margine serrato, disco concavo cum callo basali pubescenti transverso.

Plant small, epiphytic, suberect to erect, up to 3 cm tall excluding the inflorescence, the rhizomes slender, occasionally branching, 2-4 mm long between ramicauls, enclosed by 2 imbricating, long-mucronate sheaths; roots slender from nodes near the base. Ramicauls suberect, 2-4 mm long, enclosed by 2 mucronate sheaths. **Leaf** erect to suberect, coriaceous, elliptical, acute, apiculate, 8-15 mm long including the petiole 2-3 mm long, 4-6 mm wide, 5-veined, cuneate below into the petiole. **Inflorescence** a solitary, lemon yellow, resupinate flower borne by an erect, slender peduncle 4-5 cm long, with a bract near the middle; floral bract long-mucronate, 2 mm long, enclosing the pedicel and part of the ovary; pedicel 0.5 mm long, with a protruding filament 4 mm long; ovary 3 mm long; **sepals** minutely ciliate, the middle sepal suborbicular, concave, 5 mm long, 4 mm wide, the apex obtuse, contracted into a slender tail 11 mm long, 3-veined, the lateral sepals connate into a suborbicular, concave synsepal, 5 mm long, 4.5 mm wide expanded, 4-veined, the apex obtuse, contracted into a slender tail 11 mm long, bifid for 1 mm at the apex; **petals** ovate, oblique, densely minutely ciliate, 5 mm long, 3 mm wide, 3-veined, the apex obtuse, contracted into a slender tail 8 mm long; **lip** transversely ovate, 1.25 mm long, 2 mm wide, with obtuse lateral angles, the apex broadly rounded, serrate, apiculate, the disc concave behind a low carina equidistant to and parallel to the margin, the base with a pubescent, transverse callus, hinged to the column-foot; **column** stout, 0.5 mm long, 1 mm broad; pollinia 6.

ECUADOR: Prov. of Pichincha?: Pilena - Cuyambe, *F. C. Lehmann s.n.* (Holotype: K), C. Luer illustr. 14706.



This little species is known only from an Ecuadorian collection of several plants by Consul Lehmann in the nineteenth century. Unusual among Lehmann's collections, no altitude, date, or collection number is given. The specimen was among those purchased by Kew in 1906 from Lehmann's heirs in Colombia.

The most remarkable feature of the little, erect plant is the length of the peduncles, more than twice as long as the plant is tall. The small flowers were noted to be lemon yellow. The sepals and petals are minutely ciliate with filiform tails about twice as long as the blades. The tiny lip is transverse, serrate, and concave with a transverse callus across the base.

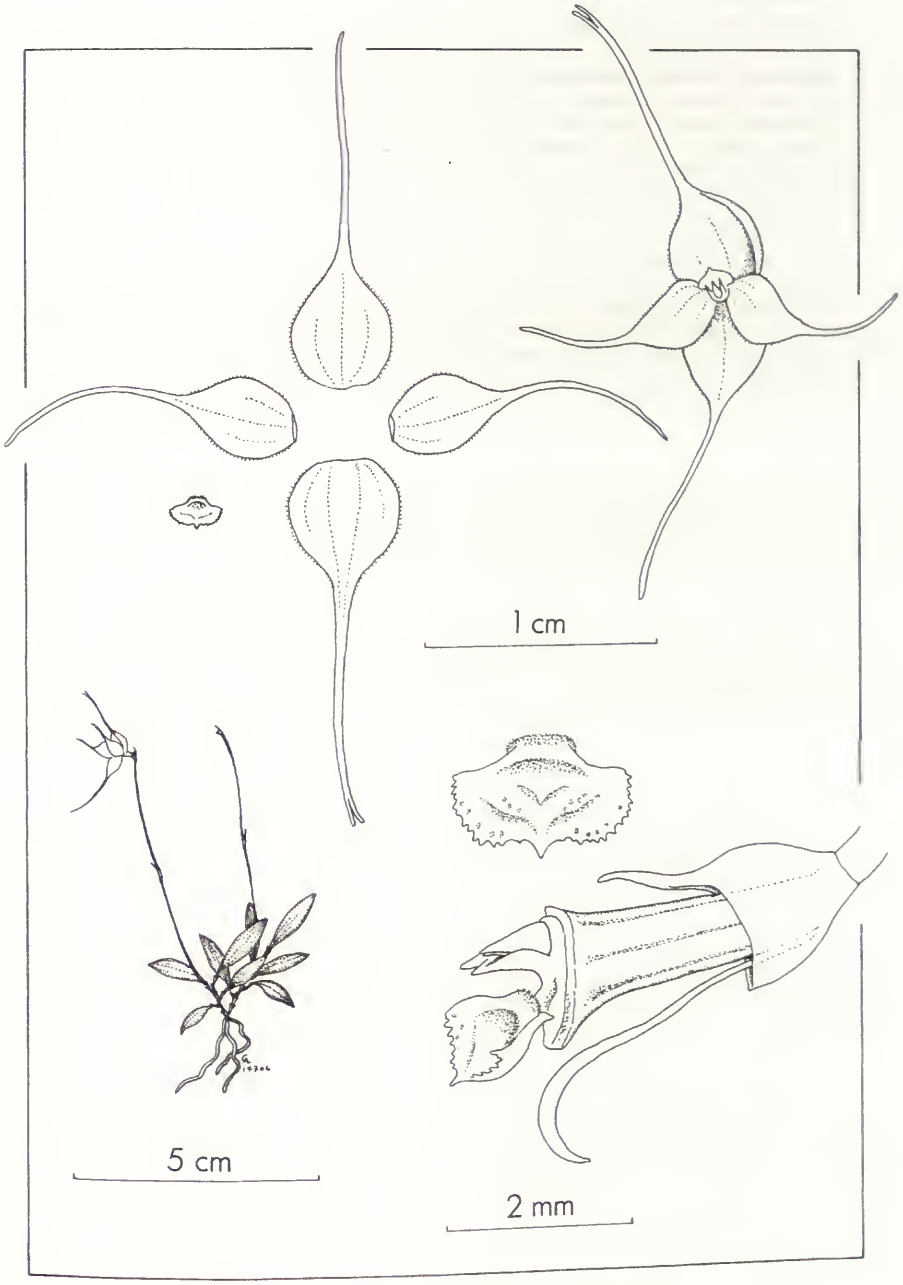


Plate 31. *Brachionidium lehmannii* Luer

Brachionidium longicaudatum Ames & Schweinf., Bull. Torrey Bot. Club 58: 348, 1931.

Ety.: From the Latin *longicaudatus*, "long-tailed," referring to the sepals.

Plant small, terrestrial, suberect to erect, up to 10 cm tall, the rhizomes stout, occasionally branching, 2-5 mm long between ramicauls, enclosed by 3 imbricating, long-mucronate sheaths; roots stout, produced from nodes near the base. Ramicauls suberect, slender, 2-3 mm long, enclosed by 2 long-apiculate sheaths. **Leaf** erect, thickly coriaceous, fleshy, elliptical, acute, apiculate, 10-11 mm long, 5-6 mm wide, apiculate, the base cuneate into a petiole 1 mm long. **Inflorescence** a solitary, ?purple, non-resupinate flower borne by an erect, slender peduncle 17-20 mm long, with an apiculate bract near the middle and another at the base; floral bract, long-mucronate, 4-5 mm long, enclosing pedicel and much of the ovary; pedicel thick, 1 mm long, with a protruding filament x mm long; ovary 5 mm long (fertilized?); **sepals** minutely ciliate, the middle sepal ovate, acute, acuminate, 12 mm long including the filiform tail 6 mm long, 3 mm wide, 3-veined, the lateral sepals connate into an ovate, acute, acuminate synsepal, 12 mm long including the tail 6 mm long, 4 mm wide, 4-veined, the tail split about half its length; **petals** minutely ciliate, ovate-oblong, oblique, acute, acuminate, 11 mm long, 2 mm wide, 3-veined; **lip** transversely ovate, 1.5 mm long, 2 mm wide, acutely deflexed near the middle, with subacute lateral angles, the apex broadly rounded, apiculate, with thickened margins, the disc covered by a broad, flat, pubescent callus extending from the middle of the front surface to all of the subquadrate back surface beneath the column and column-foot, the base hinged to the column-foot; **column** stout, 1 mm long, bidentate; pollinia ?8.

VENEZUELA: Terr. Amazonas: Summit of Cerro Duida, valley between Peaks 7 and 16, alt. 6500 ft., Aug. 1928 - Apr. 1929, *G. H. H. Tate 682* (Holotype: NY); Atabapo, Cerro Marahuaca above Salto Los Monos, alt. 2550 m, 27 Feb. 1985 *R. Liesner 18054* (VEN); Cerro Marahuaca, 12 Oct. 1988, *R. Liesner 24655* (MO), C. Luer illustr. 14370; same area, alt. 2700 m, 15 Oct. 1988, *R. Liesner 24835* (MO). Edo. Bolívar: summit of Kukenan Tepui, alt. 2550 m, 11 Apr. 1988, *R. Liesner 23155* (VEN).

This small species is apparently endemic on certain mountains in Amazonian Venezuela where it has been found on only a few occasions. Probably because of its vegetative similarity to a small specimen of what might be *B. sherringii* cited by Cogniaux as one of four types for *B. parvum*, Garay reduced *B. longicaudatum* to the synonymy of *B. parvum*. He used a drawing of *P. longicaudatum* for *B. parvum* in his publication on *Brachionidium* in 1956.

Although small, the rhizome of *B. longicaudatum* is stout and erect. The tails of the sepals and petals are as long as or longer than the blades. The lip is acutely deflexed upon itself with a large, broad, flat, pubescent callus covering all the back surface of the deflexed, clawlike base.

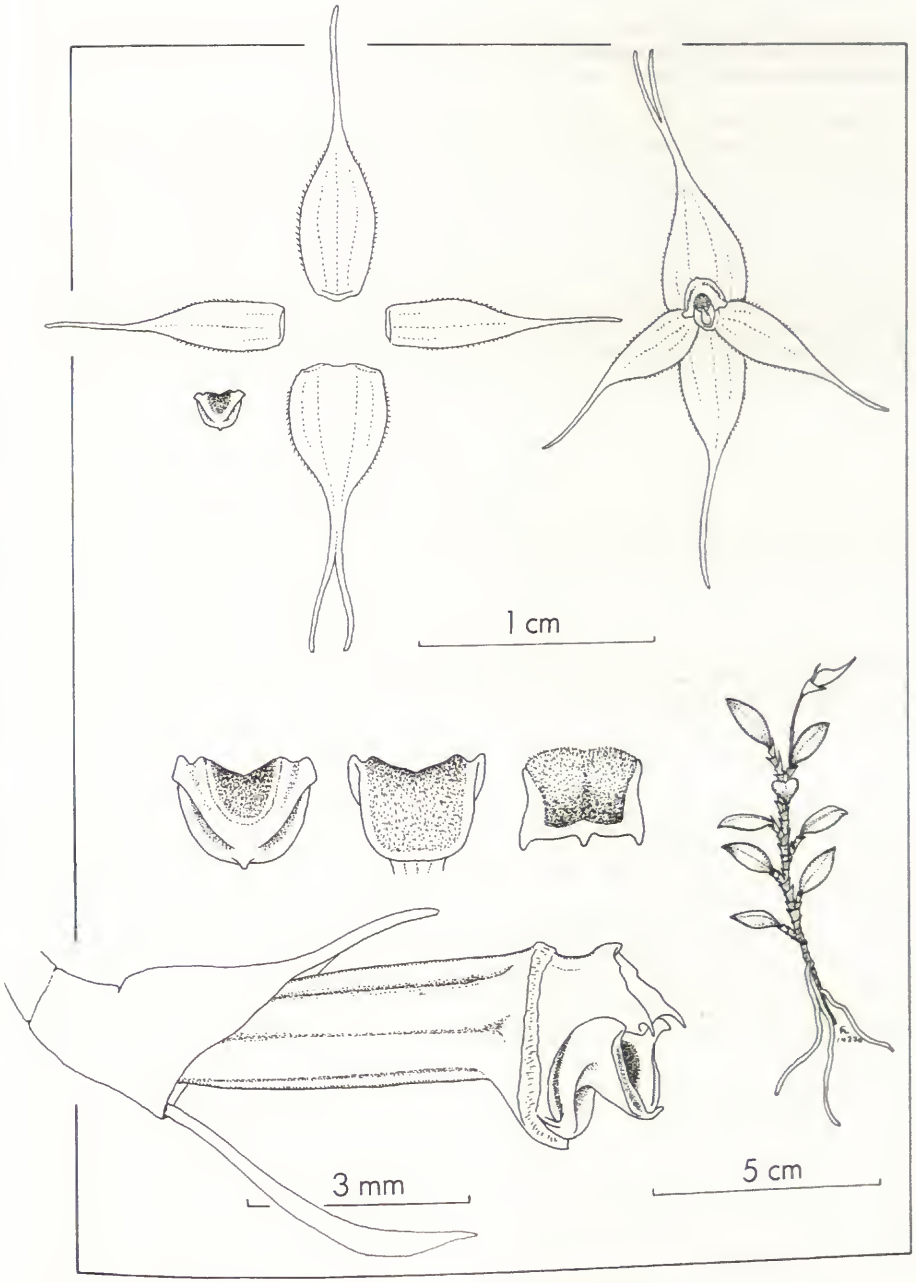


Plate 32. *Brachionidium longicaudatum* Ames & Schweinf.

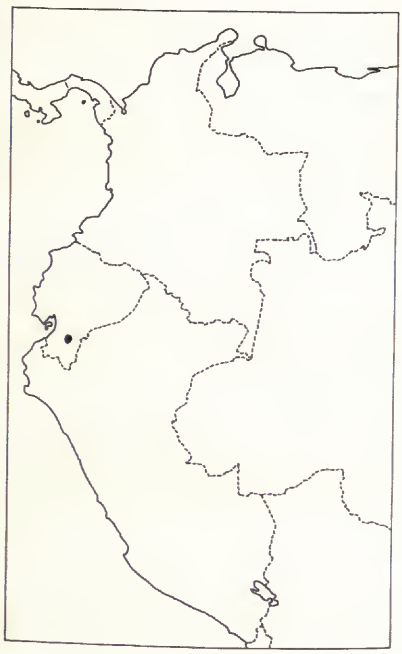
Brachionidium loxense Luer, sp. nov.

Ety.: Named for the province of Loja where this species was discovered.

Planta mediocris rhizomate crasso erecto, ramicaulibus brevibus, pedunculo foliis suborbiculatis plus minusve aequilongo, floribus comparate magnis, sepalis petalisque longicaudatis dense breviciliatis et labello transverse ovato late apiculato marginibus callosis.

Plant medium in size, robust, epiphytic, the rhizome stout, erect, up to 15 cm tall, occasionally branching, 5-10 mm long between ramicauls, 2-3 mm thick, with 3 loose, mucronate sheaths; roots coarse, from nodes toward the base. Ramicauls suberect, 5-7 mm long, enclosed by 2 similar sheaths. **Leaf** suberect, coriaceous, described as clear, bright green, 18-11 mm long including a petiole 1 mm long, the blade broadly elliptical to suborbicular, 6-8 mm wide, 7-veined, the apex rounded, notched and apiculate, the rounded base contracted into the petiole. **Inflorescence** a single, non-resupinate flower borne by a peduncle 10 mm long, from near the apex of the ramicaul; floral bract inflated, mucronate, 5-6 mm long; pedicel thick, 0.5 mm long, with a protruding filament 7-8 mm long; ovary 3 mm long; **sepals** dark red-purple, yellow toward the apices, densely short-ciliate, the middle sepal ovate, acute, acuminate, long-caudate, 26 mm long including the slender tail 15 mm long, 7 mm wide, 3-veined, the lateral sepals connate into an ovate, concave, acute, acuminate, long-tailed lamina, 26 mm long, 8.5 mm wide expanded, 4-veined, the filiform apices of the tails free for 4-5 mm; **petals** colored as the sepals, densely short-ciliate, obovate, oblique, acute, acuminate, long-caudate, 22 mm long including the tail 12 mm long, 5 mm wide, 3-veined; **lip** transversely ovoid, 3.5 mm long, 6 mm wide, the lateral angles acute, subuncinate, the apex with an obtuse apiculum, the margins with low, longitudinal lamella-like calli, the disc with a central, flattened, minutely pubescent callus; **column** stout, 2 mm long, the stigma bidentate; pollinia 8.

ECUADOR: Prov. of Loja: terrestrial among vegetation, 15 Km east of Loja, alt. 2400 m, 27 Dec. 1947, *R. Espinosa & A. Espinosa 2292* (Holotype: NY). Prov. of Zamora-Chinchipe: 14 Km east of Loja, alt. 2775 m, 21 May 1971, *B. MacBryde 330* (AMES).



Although this species occurs in an area that has been thoroughly collected by many botanists for many years, this distinctive species has apparently been recollected only once since it was first found by Reinaldo and Arsenio Espinosa in 1947.

Brachionidium loxense is related to large, robust *B. dalstroemii* that is found in a nearby mountain-pass. Both species are stout and erect with short peduncles; relatively large, long-tailed flowers; and similar, transversely ovate lips. *Brachionidium loxense* is distinguished by the smaller habit; small, round leaves; and densely short-ciliate sepals and petals.

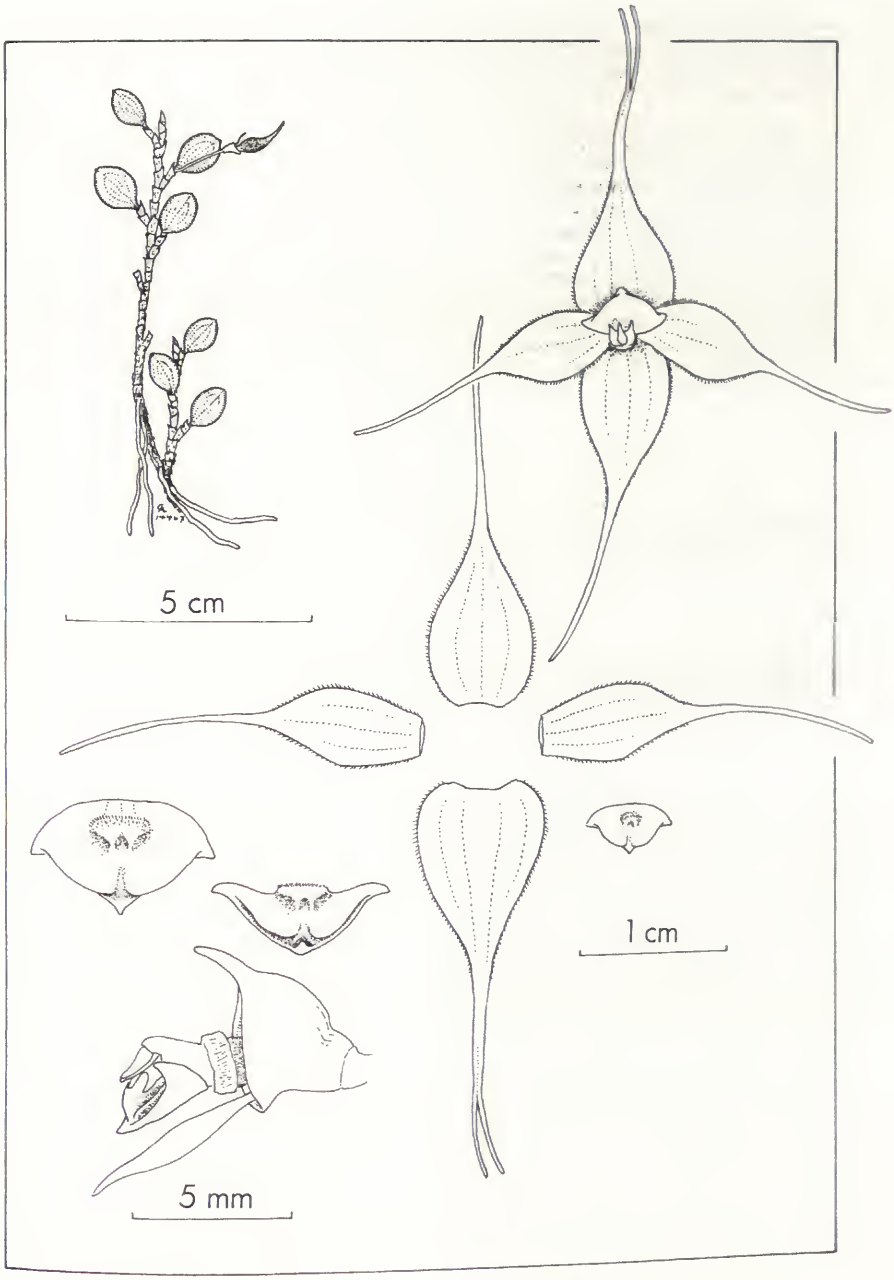


Plate 33. *Brachionidium loxense* Luer

Brachionidium lucanoideum Luer, sp. nov.

Ety.: Named for the resemblance of the lip to a stag beetle (genus *Lucanus*).

Planta grandis suberecta rhizomate gracili vaginis glabris, foliis ellipticis, 7-nervatis, flore atropurpureo, sepalo mediano synsepaloque ovatis acuminatis minutissime ciliatis longissime caudatis, synsepalo profunde concavo, petalis similibus, labello subquadrato-trilobatis, lobis lateralibus elongatis antrorsis fimbriatis apiculatis, lobo mediano brevi apiculato, callo suborbiculato pubescenti.

Plant large, epiphytic or terrestrial in loose moss, erect to suberect, up to 30 cm tall, the rhizome relatively slender, occasionally branching, 10-17 mm long between ramicauls, enclosed by 2-3 tubular, mucronate sheaths; roots coarse from near the base. Ramicauls slender, suberect, 6-7 mm long, enclosed by 2 tubular, mucronate sheaths. **Leaf** erect or suberect, coriaceous, whitish beneath, elliptical, acute to subacute, 15-28 mm long including a petiole 2-3 mm long, 6-10 mm wide, 7-veined. **Inflorescence** a solitary, non-resupinate flower borne by a slender, erect peduncle 20-28 mm long, with a bract near the middle, from near the apex of the ramicaul; floral bract inflated, acute, mucronate, 4 mm long, enclosing the pedicel and part of the ovary; pedicel 1 mm long, with a filament 5 mm long; ovary 3 mm long; **sepals** dark wine purple, minutely ciliate, the middle sepal ovate, acute, acuminate, the blade 8 mm long, 4.5 mm wide, 3-veined, the tail filiform, 2 cm long; lateral sepals connate into an ovate, deeply concave, acute, acuminate, synsepal, the blade 10 mm long, 8 mm wide expanded, 4-veined, the tail filiform, 1.5 cm long, the tips free for 2 mm; **petals** deep wine red, minutely ciliate, ovate, oblique, subacute, acuminate, the blade 6 mm long, 5 mm wide, 3-veined, the tail 17 mm long; **lip** purple, subquadrate-trilobed, 3 mm long, 2 mm wide, the lateral angles elongated, antrorse, fimbriate, acute, apiculate, the middle lobe short, apiculate, the disc with a suborbicular, pubescent callus; **column** stout, bidentate, 2 mm long; pollinia 6.

PANAMA: Prov. of Chiriquí: elfin forest along the ridge of the continental divide northeast of Cerro Pate Macho above Palo Alto, alt. 2200 m, 24 Apr. 1982, *S. Knapp & R. Schmalzel 4829* (Holotype: MO; Isotypes: AMES, K, US), C. Luer illustr. 14559.

This species is apparently endemic in a wet, cloud forest along the continental divide in western Panama where it was discovered by Knapp and Schmalzel of the Florida State University. It is identified by the more or less erect habit; elliptical leaves; dark purple flowers produced in abundance; and minutely ciliate, long-caudate sepals and petals. From vegetatively similar, sympatric species (*B. calypso*, *B. dressleri* and *B. satyreum*) *B. lucanoideum* is distinguished by a unique, subquadrate lip with elongated antrorse lateral lobes that are fimbriate and apiculate, and with a small, apiculate, middle lobe. The rounded callus in the middle of the disc is pubescent.

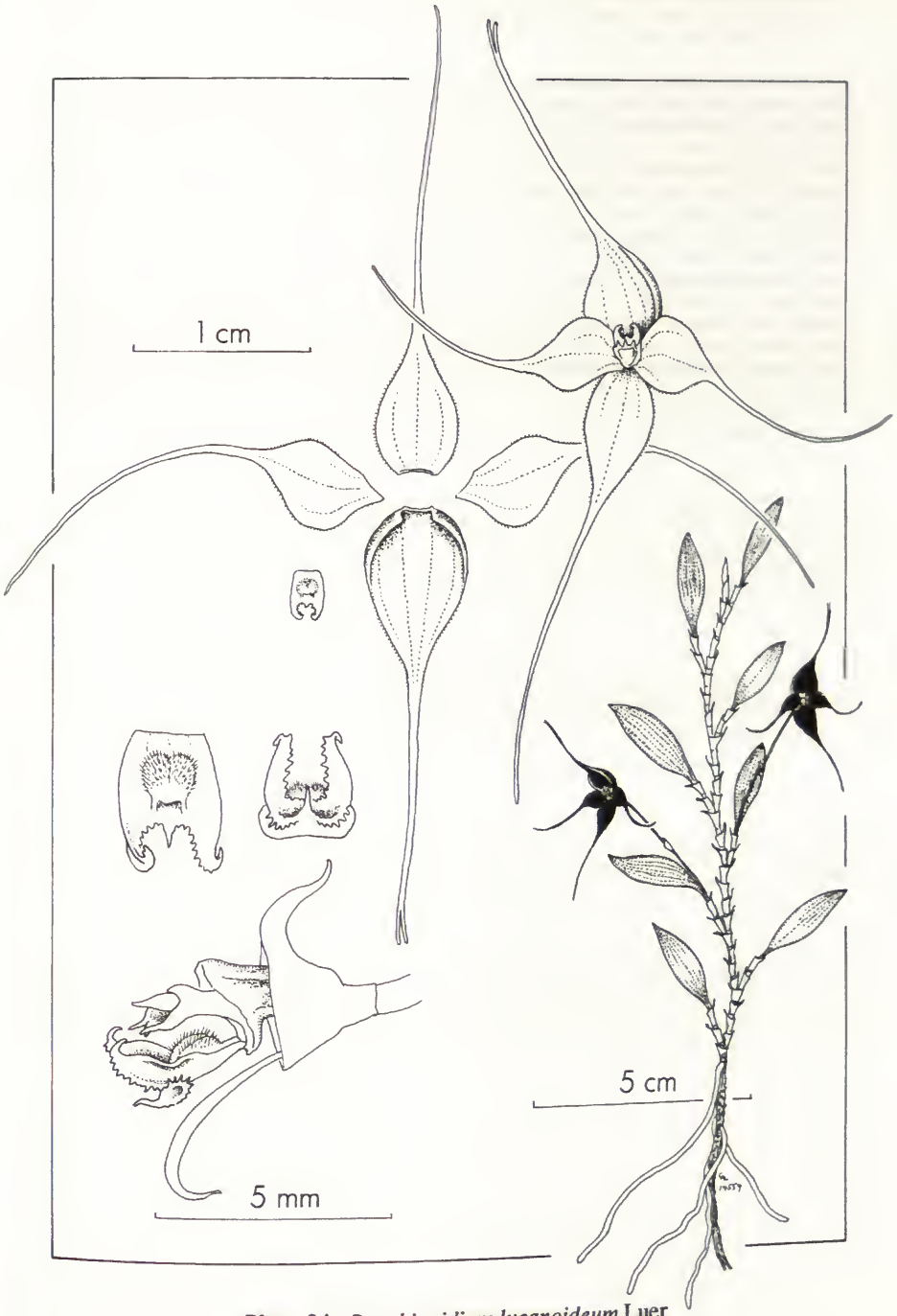


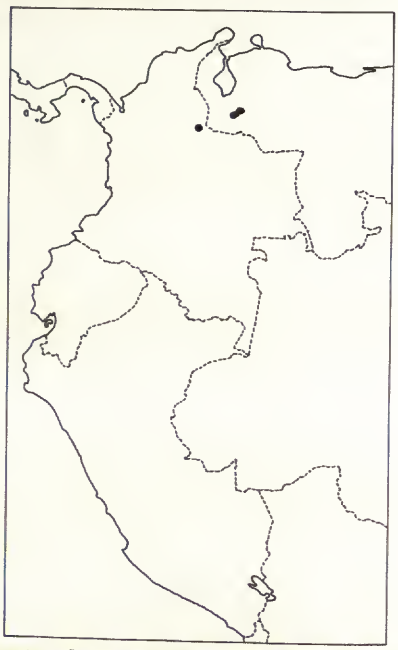
Plate 34. *Brachionidium lucanoideum* Luer

Brachionidium meridense Garay, Canad. J. Bot. 34: 736, 1956.

Ety.: Named for the Venezuelan state of Mérida, the state to the southwest of the state of Trujillo where the species was discovered.

Plant small, epiphytic, long-repent, the rhizome slender, prone, up to 30 or more cm long, 5-20 mm long between ramicauls, each enclosed by 3 imbricating, shortly mucronate sheaths; roots thick, one from a node. Ramicauls suberect, 2-4 mm long, enclosed by 2 similar sheaths. **Leaf** erect, coriaceous, 8-25 mm long including the 1-5 mm long petiole, the blade elliptical, subacute, 5-6 mm wide, 7-veined, the base cuneate. **Inflorescence** a solitary, non-resupinate, light brown flower borne by an erect, slender peduncle 10-15 mm long, with a bract below the middle and at the base, from near the apex of the ramicaul; floral bract inflated, oblique, mucronate, 2.5 mm long; pedicel 0.5 mm long, with a filament 2.5 mm long; ovary 1.5 mm long; **sepals** eciliate, translucent, the middle sepal ovate, acute, acuminate, shortly caudate, 8 mm long, 3.5 mm wide, 3-veined, the lateral sepals completely connate into an ovate, acute, acuminate synsepal, 7.5 mm long, 3 mm wide, 4-veined; **petals** eciliate, ovate, oblique, acute, acuminate, 7 mm long, 2.25 mm wide, 3-veined; **lip** transversely trapeziform from above, transversely cordate from in front, 1.75 mm long, 2.5 mm wide, the lateral angles obtuse, each with a minute apiculum, the apex broadly rounded, with an obtuse apiculum, the margins callous, the disc with a flat, triangular, minutely pubescent callus; **column** stout, 1 mm long, with 6 pollinia.

VENEZUELA: Edo. de Trujillo: between Bocono and La Cuchilla, alt. 2800 m, 3 Nov. 1951, *J. Renz 7507* (Holotype: Herb. J. Renz); between Santa Cruz de Mora and El Molino, alt. 2800 m, 12 Nov. 1949, *J. Renz 6110* (Herb. J. Renz); between Tovar and Guanaque, alt. 2400 m, 18 July 1951, *J. Renz 7252* (Herb. J. Renz);
COLOMBIA: Dept. of Santander: epiphytic in cloud forest east of Bucaramanga toward Berlin, alt. 3000 m, 7 May 1984, *C. Luer, J. Luer, R. Escobar & E. Valencia 10194* (MO).



Brachionidium meridense is a small weak, creeping species found in the Eastern Cordillera of Colombia and western Venezuela where it was first discovered by Dr. Jany Renz. The flowers of the Colombian collection are slightly smaller than those of the type from Venezuela, and the tail of the synsepal of the latter is minutely bifid.

The small, more or less upright, narrowly elliptical leaves are spaced along a slender rhizome that creeps in loose, mossy humus. Although small, the translucent, pale brown flowers with similar, acuminate sepals and petals are nearly as large as the leaves. The lip is broadly transverse.

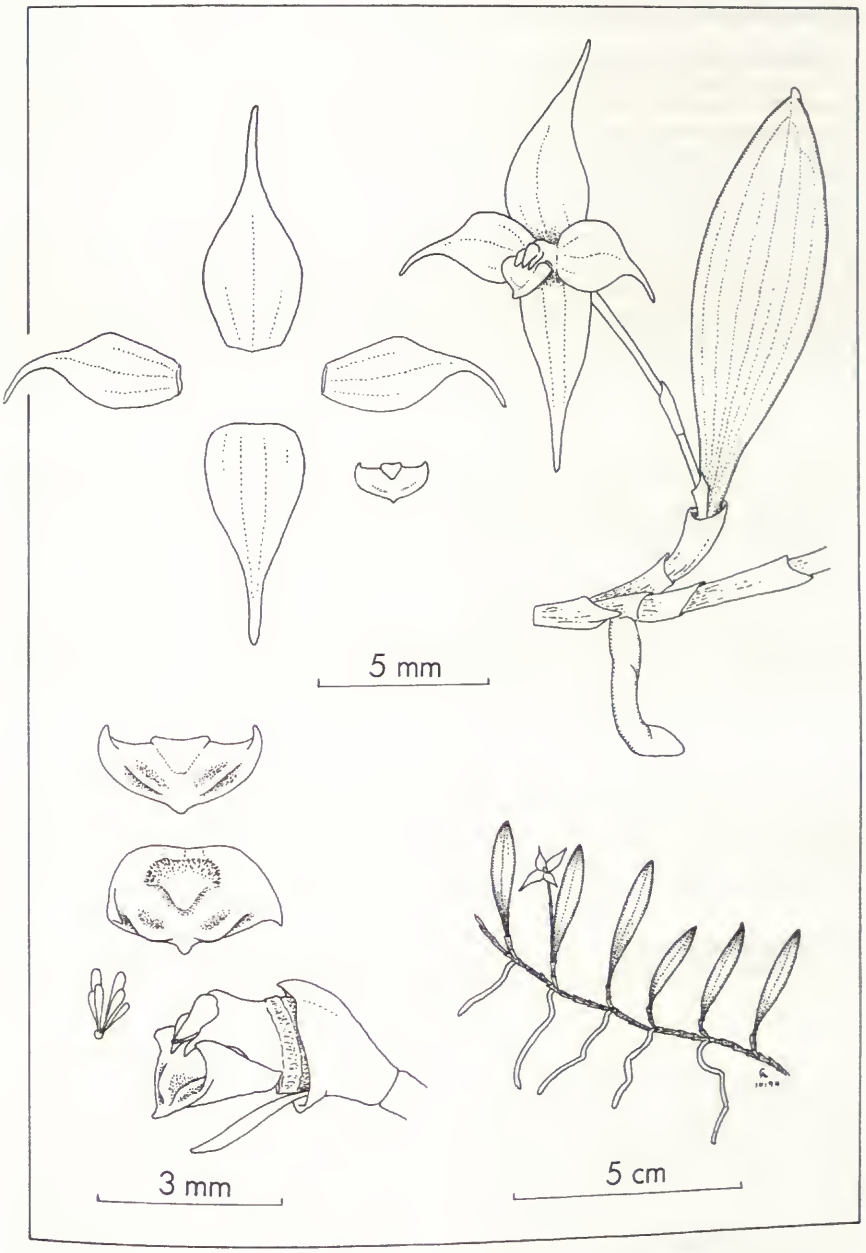


Plate 35. *Brachionidium meridense* Garay

Brachionidium minusculum Luer & Dressler, sp. nov.

Ety.: From the Latin *minusculus*, "very small," referring to the habit of the plant.

Species haec *B. pusillo* Ames & Schweinf. similis, sed foliis minoribus, pedunculo breviore, synsepalo petalisque glabris et labello minore cum angulis lateralibus brevioribus falcatis differt.

Plant very small in size, epiphytic, long-repent, the rhizome slender, occasionally branching, up to 10 cm long or longer, 5-10 mm long between ramicauls, each segment with 3 shortly mucronate sheaths; roots produced singly from a node. Ramicauls suberect, 0.5 mm long, enclosed by a similar sheath. **Leaf** erect, thickly coriaceous, elliptical, 4-5 mm long, 2.5-3 mm wide, obtuse and minutely forked and apiculate at the apex, 5-veined, cuneate below to the base. **Inflorescence** a solitary, small, resupinate flower comparatively large for the plant, borne by an erect peduncle 3.5 mm long, with a bract above the base, from near the apex of the ramicaul; floral bract infundibular, acute, apiculate, 1.5 mm long, enclosing the pedicel and ovary; pedicel 0.3 mm long, with a filament 2 mm long; ovary 1 mm long; **sepals** translucent purple, the middle sepal sparsely short-ciliate, ovate, acute, acuminate, caudate, 7 mm long including the filiform tail 4 mm long, 1.5 mm wide, 3-veined, the lateral sepals glabrous, completely connate into a narrowly triangular, acute, acuminate, caudate synsepal, 6 mm long including the tail, 1 mm wide, 2-veined; **petals** translucent purple, glabrous, ovate, slightly oblique, acute, acuminate, caudate, 6.5 mm long including the filiform tail, 1 mm wide, 1(3)-veined; **lip** transversely trapeziform, 0.5 mm long, 1 mm wide, the lateral angles falcate, acute, the apex rounded, concave, apiculate, the disc with an ovoid, minutely pubescent callus; **column** stout, 0.5 mm long, bidentate, pollinia presumably 6.

COSTA RICA: Prov. of Cartago: Tapantí, alt. m, *R. L. Dressler & Dora Mora de Retana s.n.* (Holotype: CR; Isotype: MO), C. Luer illustr. 17244.

This tiny, long-repent species is known only from one collection by Dressler. Vegetatively it appears similar to *B. pusillum*, except that the leaves are considerably smaller. The flowers of the two species are very similar in size and shape. The flower of the one specimen of *B. minusculum* is purple, while the flowers of *B. pusillum* are usually yellow. The dorsal sepal of *B. minusculum* is microscopically sparsely ciliate while the synsepal and petals are glabrous; the sepals and petals of *B. pusillum* are shortly ciliate. The lateral angles of the tiny, one-millimeter-wide lip are falcate. The lip of *B. pusillum* is three times wider with large, acute, triangular, lateral lobes.

Brachionidium muscosum Luer & Vásquez, Phytologia 55: 177, 1984.

Ety.: From the Latin *muscosus*, "mossy," in reference to the habitat and appearance of the plant.

Plant small, epiphytic in loose moss, long-repent, the rhizome slender, occasionally branching, up to 10 cm long, 2-5 mm long between ramicauls, each enclosed by 3 imbricating sheaths with narrowly mucronate apices; roots comparatively thick, from nodes on the rhizome. Ramicauls suberect, 1.5-2 mm long, enclosed by 2 narrowly mucronate sheaths. **Leaf** suberect, coriaceous, 8-10 mm long including the 1 mm long petiole, the blade elliptical, acute, apiculate, 3-4.5 mm wide, 3-veined, the base cuneate. **Inflorescence** a solitary, non-resupinate, translucent white flower borne by an erect, slender peduncle 12-14 mm long, with a bract below the middle and at the base, from near the apex of the ramicaul; floral bract infundibular, mucronate, 1.5 mm long; pedicel 0.5 mm long, with a filament 2 mm long; ovary 1 mm long; **sepals** ciliate, the middle sepal ovate, acute, acuminate, long-caudate, 10 mm long including the tail 6.5 mm long, 1.75 mm wide, 3-veined, the lateral sepals completely connate into an ovate, acute, acuminate, long-caudate synsepal, 10.5 mm long including the tail 7.5 mm long, 1.8 mm wide, 2-veined; **petals** minutely fimbriate, ovate, oblique, acute, acuminate, long-caudate, 7 mm long including the tail 4 mm long, 1.25 mm wide, 1-veined; **lip** thick, transversely cordate, lightly concave, 1.25 mm long, 1.75 mm wide expanded, the lateral angles obtuse to rounded, the apex obtuse, minutely apiculate, the disc with a low, flat, triangular, minutely pubescent callus; **column** stout, 0.5 mm long, with 6 pollinia.

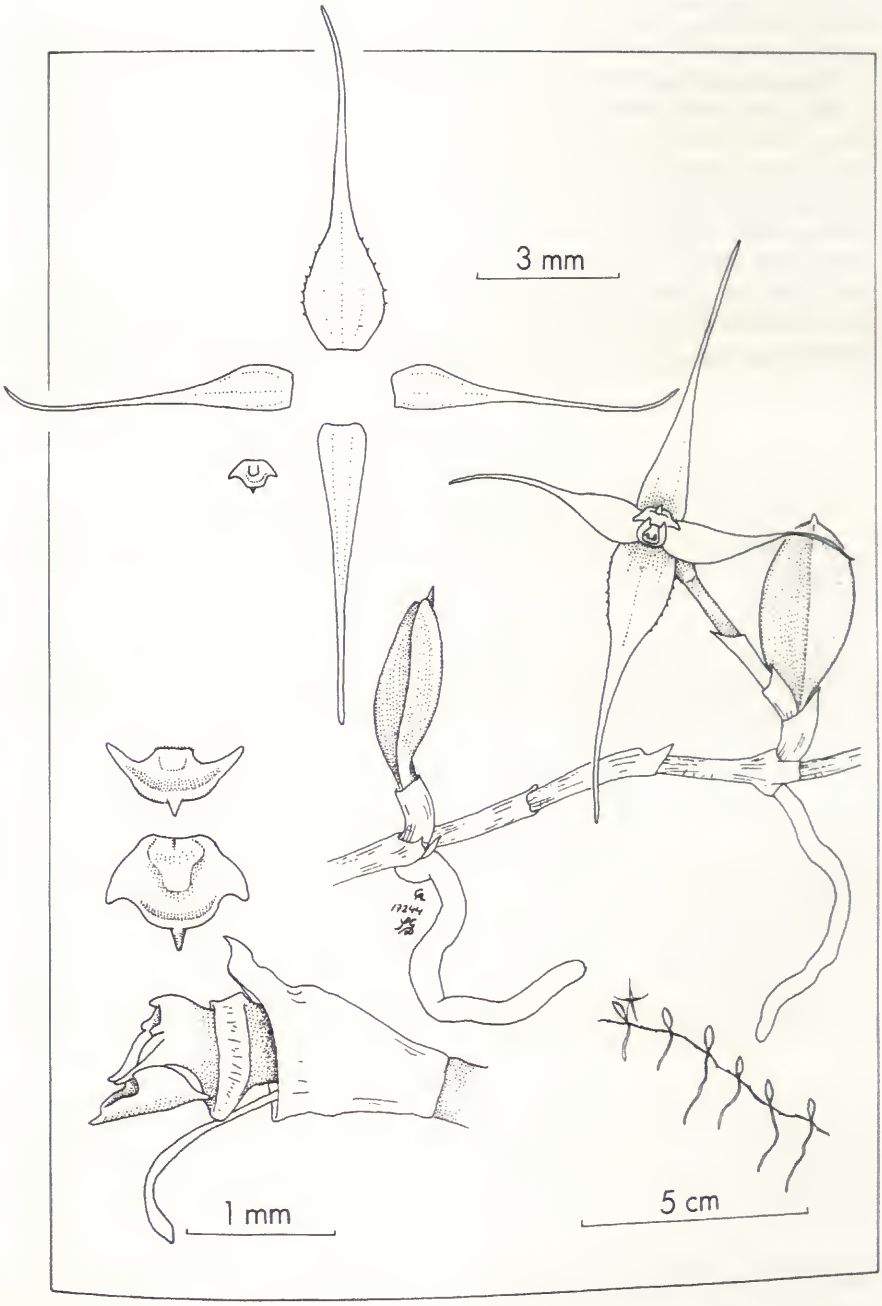
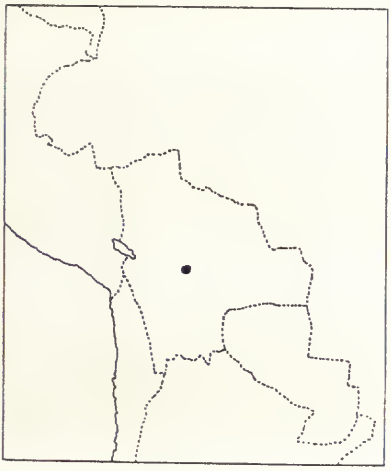


Plate 36. *Brachionidium minusculum* Luer & Dressler

BOLIVIA: Dept. of Cochabamba: Prov. of Chapare, epiphytic in moss in cloud forest northeast of Cochabamba, alt. 1850 m, 29 Jan. 1984, *C. Luer, J. Luer & R. Vásquez 9452* (Holotype: SEL)



This tiny, creeping species, discovered by Jane Luer, grows intertwined in loose mats of moss around the shaded bases of trees in a moist cloud forest on the northern slope of the Andes of central Bolivia. The long-tailed, fragile, little flowers with ciliate sepals and minutely fringed petals are colorless and nearly transparent. The lip is ovate and apiculate. To date, it has not been found again there or elsewhere.

Brachionidium neblinense Carnevali & Ramírez, Ernstia 39: 9, 1986.
Ety.: Named for Camp Neblina on the divide between Brazil and Venezuela.Río Negro.

Plant small to medium in size, epiphytic, the rhizome erect to suberect, branching, stout, 1.5-2 mm thick, up to 5 cm tall, 4 mm long between ramicauls, each segment enclosed by 2-3 imbricating, mucronate sheaths; roots slender, from near the base. Ramicauls suberect, 4 mm long, enclosed by 2 loose, mucronate sheaths. **Leaf** suberect, coriaceous, elliptical, acute, apiculate, 15-20 mm long including the petiole 1.5-2 mm long, 6-7 mm wide, 7-veined, the base cuneate into the petiole. **Inflorescence** a solitary, red-violet, presumably non-resupinate flower borne by an erect, slender peduncle 23 mm long, with a bract below the middle and at the base, from near the apex of the ramicaul; floral bract infundibular, mucronate, 4-5 mm long, enclosing the pedicel and ovary; pedicel 1.5 mm long, with a filament 5 mm long; ovary 1.5 mm long; **sepals** eciliate, the middle sepal ovate, acute, 11 mm 6 mm wide, 3-veined, the lateral sepals completely connate into an ovate, obtusely short-acuminate, concave synsepal, 11 mm long, 7.5 mm wide, 4-veined; **petals** eciliate, elliptical, oblique, acute, acuminate, 10 mm long 4 mm wide, 3-veined; **lip** not seen, reportedly transversely ovate, 2 mm long, 3 mm wide, obtuse, with obtuse lateral angles, without details; **column** not seen, reportedly with 6 pollinia.

VENEZUELA: Terr. Fed. Amazonas: Rio Negro, Camp Neblina at the divide between Brazil and Venezuela, alt. 2000 m, 15 Apr. 1984, *T. Plowman & W. W. Thomas 13584* (Holotype: VEN), C. Luer illustr. 14802.

This species is known from the border between Brazil and Venezuela, where it was discovered by Tim Plowman. The type-specimen is incomplete, the lip being absent. The published illustration lacks details. There is no isotype at F where it was reported.

This small species with acute, noncaudate, glabrous sepals and petals is very similar to the *B. restrepioides* from southern Brazil. Except for the eight pollinia of *B. restrepioides*, and the reported six pollinia of *B. neblinense*, there seems to be little difference. Unfortunately, the lips cannot be compared.

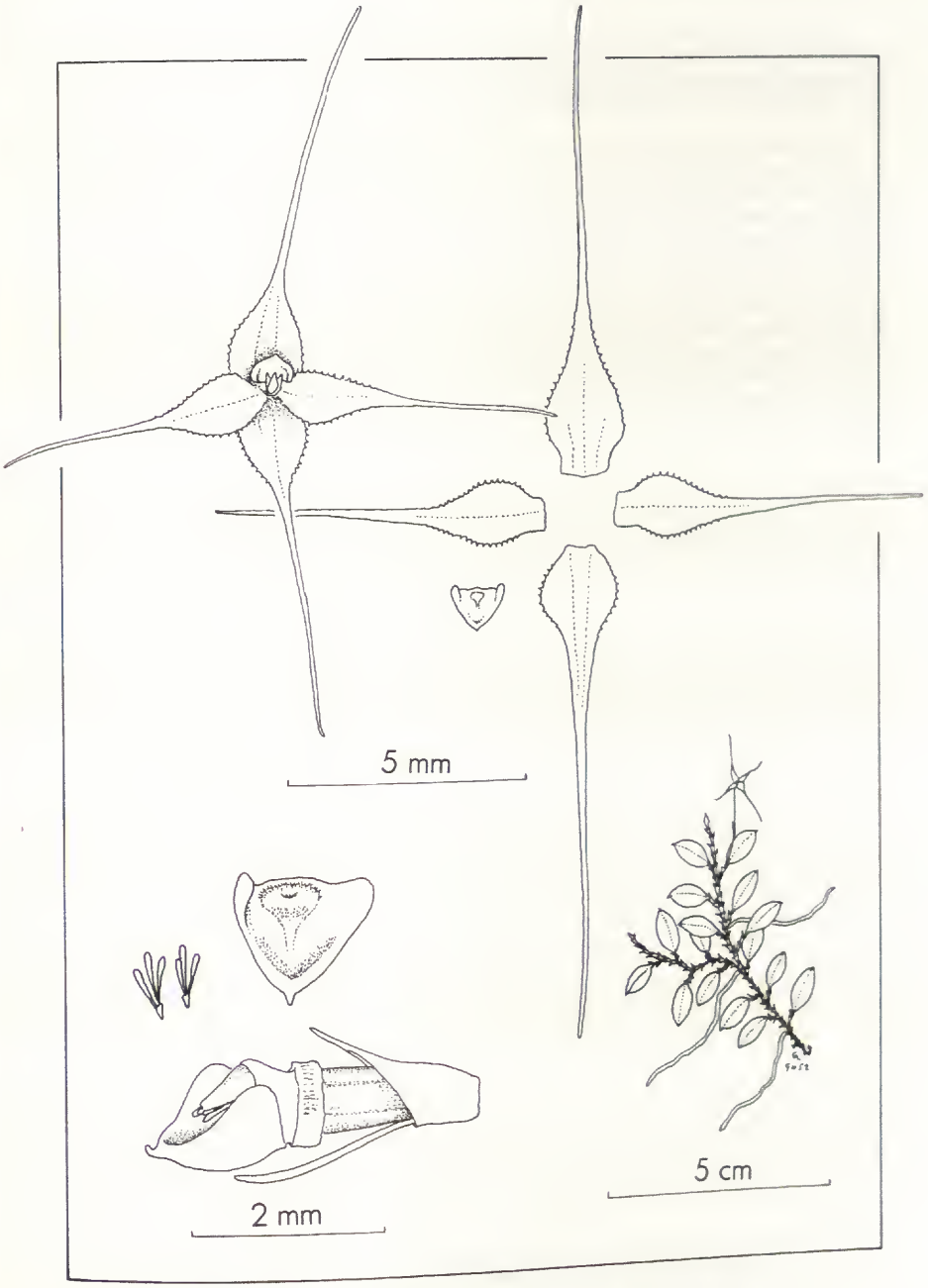


Plate 37. *Brachionidium muscosum* Luer & Vásquez

Brachionidium operosum Luer & Hirtz, sp. nov.

Ety.: From the Latin *operosus*, "laborious," referring to the difficulty in reaching the remote habitat.

Planta parva erecta rhizomate crasso vaginis glabris mucronatis, foliis ellipticis verrucosis 5- vel 7-nervatis, flore albo ecaudato, sepalo synsepaloque late ellipticis obtusis brevissime acuminatis, petalis late ellipticis obtusis breviter acuminatis, labello late elliptico lateribus late rotundatis tenuibus erectis, apice triangulari acuto, callo hippocrepiformi pubescenti.

Plant small, epiphytic, suberect, up to 3 cm tall, the rhizome relatively stout, occasionally branching, 1.5-5 mm long between ramicauls, enclosed by 2-3 tubular, mucronate sheaths; roots fleshy, from near the base. Ramicauls suberect, 2-3 mm long, enclosed by 2 tubular, mucronate sheaths. **Leaf** erect or suberect, coriaceous, verrucose, elliptical, acute, apiculate, 11-13 mm long including a petiole 1-2 mm long, 3.5-4.5 mm wide, 5- to 7-veined, cuneate below into the petiole. **Inflorescence** a solitary, non-resupinate, flower borne by a comparatively stout, erect peduncle 12 mm long, with a bract near the middle, from near the apex of the ramicaul; floral bract inflated, acute, 2.5 mm long, enclosing the pedicel and part of the ovary; pedicel 0.5 mm long, with a filament 3 mm long; ovary 1.5 mm long; **sepals** translucent white, minutely ciliate, the middle sepal missing, the lateral sepals connate into a broadly elliptical synsepal, 6.5 mm long, 4.5 mm wide, 4-veined, the apex broadly obtuse, very shortly acuminate; **petals** white, minutely ciliate, broadly elliptical, 6 mm long, 3.75 mm wide, 3-veined, the apex obtuse, acuminate into a short apiculum; **lip** rose, broadly ovate, not deflexed upon itself, 4 mm long, 3.5 mm wide expanded, the sides broadly rounded, erect, the apex triangular, acute, the disc with a pubescent callus above the base; **column** stout, 1 mm long, pollinia unknown.

ECUADOR: Prov. of Pastaza: epiphytic in cloud forest along Río Zuñag, alt. 2700 m, 23-28 Feb. 1990, *A. Hirtz, S. Dalström, L. Åmby, J. del Hierro, E. Astorga, S. Ortega & J. Cabezas 4637* (Holotype: MO), C. Luer illustr. 14783.

This species is known only from the type-collection. Apparently only one small plant with an incomplete flower was found. Much of the middle sepal is missing. However, the material at hand is sufficient to permit a description.

The mature leaves are verrucose on the dorsum, while immature leaves appear to have been smooth. The sepals and petals are broadly elliptical, tailless, and ciliate. The most distinctive lip is thin and flat, except for the upcurved, broadly rounded sides, and it is longer than broad even when expanded. The callus is pubescent.

Brachionidium parvifolium (Lindl.) Lindl., Folia Orch. *Brachionidium* 1, 1859.

Bas.: *Restrepia parvifolia* Lindl., Orch. Lind. 4, 1846.

Ety.: From the Latin *parvifolius*, "small-leaved," referring to the size of the leaves in comparison to those of other species in the genus *Restrepia*.

Plant large, terrestrial, erect, up to 1 meter tall, the rhizome stout, 2-9 cm long between ramicauls, with 3 distant, smooth tubular sheaths, rooting from the base. Ramicauls erect to suberect, branching, 0.5-2 cm long, enclosed by 2 imbricating, shortly mucronate sheaths. **Leaf** erect, coriaceous, 3-6.5 cm long including the 3-6 mm long petiole, the blade elliptical, acute, 1.5-2 cm wide, 11- to 13-veined, the base cuneate into the petiole. **Inflorescence** a large, showy, solitary, non-resupinate, bright purple flower borne by an erect, slender peduncle 3-6 cm long, with a bract near the middle and near the base, from near the apex of the ramicaul; floral bract inflated, mucronate, 5-7 mm long, enclosing the pedicel and

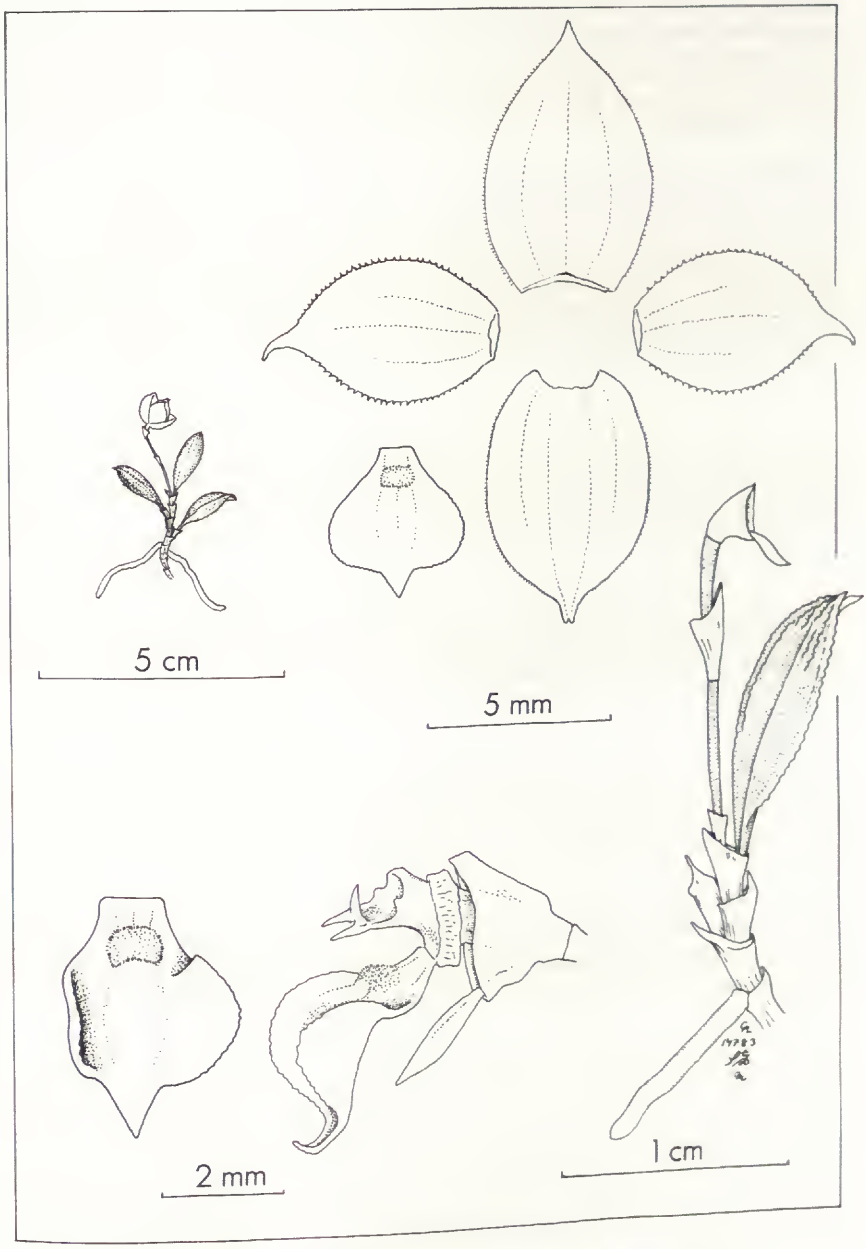
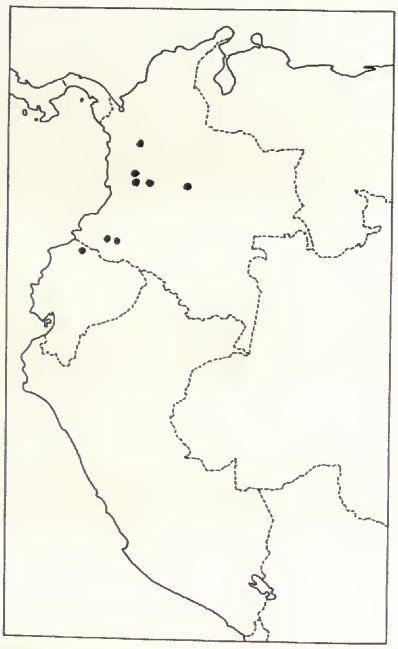


Plate 38. *Brachionidium operosum* Luer & Hirtz

part of the ovary; pedicel 1.5-2.5 mm long, with a filament 5-10 mm long; ovary 5-6 mm long; **sepals** eciliate, the middle sepal ovate, subacute, acuminate, caudate, 30-45 mm long including the 1.2-2 cm long tail, 12 mm wide, 5-veined (occasionally an accessory vein is present on either or both sides), the lateral sepals connate into an ovate, acute, acuminate, concave, bicaudate synsepal, 30-45 mm long including the tails 10-20 mm long, 14-16 mm wide expanded, 6-veined; **petals** minutely short-ciliate, ovate, oblique, subacute, acuminate, caudate, 25-45 mm long including the tail 12-20 mm long, 8-9 mm wide, 5-veined; **lip** dark purple, transversely cordate, 4 mm long, 6 mm wide, the lateral angles subacute, incurved, the apex rounded, minutely apiculate, the margins with broad, longitudinal, concave calli, the disc with a low, flat, minutely pubescent callus with a glenion anteriorly; **column** stout, 1-2 mm long, 3 mm wide; pollinia 8.



COLOMBIA: Dept. of Tolima; on the slope of the Peak of Tolima, creeping among mosses and over old stunted trees at 12000' of elevation, Mariquita, 1842, *J. Linden 1278* (Holotype: K, Isotypes: BR, W). Dept. of Antioquia: May 1873, *C. Patin s.n.* (K, W). Dept. of Cauca: La Gallera, Micay Valley, 1 July 1922, *E. Killip 7973* (AMES). Dept. of Cundinamarca: north of San Miguel, alt. 2800 m, 9 Feb. 1941, *J. Renz 3835* (AMES, Herb. J. Renz); 15 Km. SE of Gutiérrez, ridge above San Antonio, alt. 2775 m, 3 Aug. 1944, *M. L. Grant 9827* (US); near Sibaté, San Miguel, alt. 2900 m, 4 Apr. 1948, *J. S. Hawkes & H. Garcia-Barriga s.n.* (K), 7 June 1948, *J. S. Hawkes & H. Garcia-Barriga 40* (US). Dept. of Putumayo: Santiago near Pasto, alt. 9000 ft., 1 Nov. 1878, *F. C. Lehmann s.n.* (AMES, W); eastern slopes of the cordillera above Pasto, alt. 3000 m, 24 Feb. 1880, *F. C. Lehmann 531a* (G); same area, 15 Feb. 1881, *F. C. Lehmann 344* (AMES, G, W); between La Cocha and Sibundoy, alt. 2700 m, 1 Aug. 1978, *C. Luer, J. Luer, R. Escobar et al. 3122* (MO, SEL); same area, alt. 3000 m, 26 Jan. 1987, *C. Luer, J. Luer, R. Escobar, O. Benavides & C. Dodson 12536* (K, MO). Dept. of Risaralda: Santa Rosa de Cabal, finca Berlin, terrestrial in wet forest, alt. 3000 m, 22 July 1991, *A. De Wilde 3777* (MO); Pueblo Rico, south of Pueblo Rico along new TV road, alt. 2400, 14 May 1993, *C. Luer, J. Luer, A. De Wilde & J. Julián 16827* (MO). Without locality: *J. H. Chesterton 3* (W); *G. Wallis 112* (W).
ECUADOR: Prov. of Napo: forest south of Santa Barbara, alt. 2700 m, 6 Apr. 1985, *C. Luer, J. Luer & A. Hirtz 11102* (MO).

This, the first species of the genus to be described, is one of the largest, perhaps the most frequent, and one of the most widely distributed of all the species in the genus. It is found in the central and western cordilleras of Colombia and northernmost Ecuador at altitudes around 3000 meters above sea-level. Several closely allied species occur sympatrically.

Brachionidium parvifolium grows terrestrially, more or less erect and climbing among shrubs in subparamo cloud forests. Although the specific epithet indicates small leaves, some of the leaves of *B. parvifolium* are some of the largest in the genus. The shiny, purple flowers are widely expanded with slender tails about as long as their respective blades, The middle sepal is five-veined, occasionally with an accessory pair. Although previously assumed to have six pollinia without having been investigated, this species, the type of the genus, has eight pollinia.

Two closely allied, essentially sympatric species also each with eight pollinia, are now known. *Brachionidium fornicatum* is distinguished by the cucullate, uppermost synsepal with a short tail, and *B.imperiale* is distinguished by broad, multiveined sepals with exceedingly long, filamentous tails.

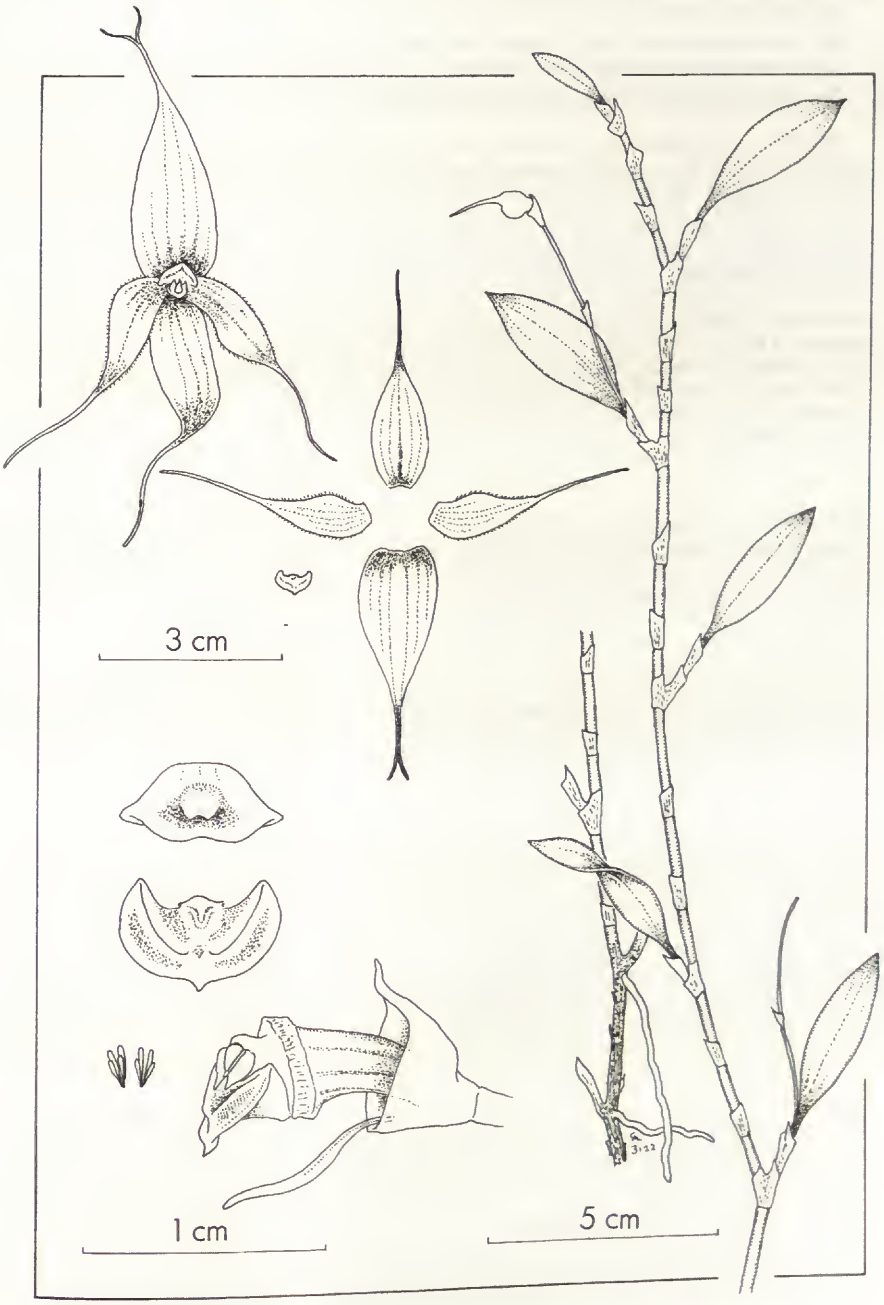


Plate 39. *Brachionidium parvifolium* (Lindl.) Lindl.

Brachionidium parvum Cogn., Repert. Spec. Nov. Regni Veg. 6: 307, 1909.

Ety.: From the Latin *parvus*, "small," referring to the habit.

Syn.: *Brachionidium dussii* Cogn. in Urban, Symb. Antill. 6: 451, 1910.

Ety.: Named in honor of the Rev. Pére Antoine Duss, who first collected this species.

Syn.: *Brachionidium sherringii* var. *parvum* (Cogn.) Stehlé, Fl. Descript. Antill. Franc. 1: 219, 1939.

Plant very small, epiphytic, up to 8 cm tall, caespitose, or the rhizome ascending to erect, occasionally branching, 0.5-4 mm long between ramicauls, enclosed by 1-2 mucronate sheaths; roots comparatively coarse, near the base of the rhizome. Ramicauls suberect to erect, slender, 3-4 mm long, enclosed by 2-3 similar sheaths. **Leaf** suberect to erect, coriaceous, 8-16 mm long including a petiole 2-3 mm long, the blade elliptical, acute, 2.5-5 mm wide, 7-veined, the base cuneate. **Inflorescence** a solitary, non-resupinate flower, light greenish to purple, borne by a slender, erect peduncle 12-23 mm long, with a bract near the middle, from the ramicaul near the apex; floral bract inflated, long-mucronate, 2-2.5 mm long, enclosing the pedicel and ovary; pedicel 0.5 mm long, with a filament 2.5-4 mm long; ovary 2-4 mm long, often fertilized; **sepals** subcarinate, minutely ciliate, the middle sepal ovate, concave, subacute, acuminate, 5-8.5 mm long including a tail 1.5-4 mm long, 2.5-3 mm wide expanded, 3-veined, the lateral sepals connate into a concave, ovate, acute, acuminate synsepal 5.5-8.5 mm long including the tail 1.5-3.5 mm long, 2.5-3 mm wide expanded, 4-veined; **petals** minutely ciliate, elliptical, oblique, acute, acuminate, 5-8.5 mm long including the tail 1.5-4 mm long, 1.5-2.5 mm wide, 3-veined; **lip** subtrapeziform, 1-1.5 mm long, 1.5-1.75 mm wide, the lateral angles subacute, the apex broadly rounded with a short apiculum, minutely callous within the margins, sometimes minutely irregular or subdenticulate, the disc with an ovoid, pubescent callus below the middle; **column** 0.5 mm long, 1 mm broad; pollinia 6.

GRENADA: "in solo argilloso inter Soulier et Azimar, cuttings, roadside, going to Grand Etang," 4 July 1895, *W. E. Broadway 268* (Lectotype here designated: K; Isolectotype: BR); C. Luer illustr. 14462; Azimar Mts., 18 Oct. 1905, *W. E. Broadway s.n.* (AMES, F); Banks of Azimar, Oct. 1904, *W. E. Broadway s.n.* (NY, US); Azimar Mts., 17 Nov. 1905, *R. Cameron s.n.* (AMES).

GUADELOUPE: epiphytic in forest at Bains-Jaunes, pied de la Soufrière, *P. A. Duss 4149* (Holotype of *B. dussii*, destroyed at B); La Soufrière, chemin des Dames, alt. 1300 m, 21 Mar. 1982, *C. Sastre 7475* (Neotype: P; C. Sastre, 1991); Massif de la Soufrière, alt. 1300 m, 21 Oct. 1974, *J. Jérémie 340, 343* (AMES, P), C. Luer illustr. 15477; Chemin des chutes du Carbet, Talus ruisselant, 26 Sept. 1974, *J. Jérémie & J. Fournet 2066* (GUAD).

DOMINICA: Rosalie Valley, 1904, *F. E. Floyd 930C* (NY); St. Patrick Parish, top of Mome Nicholls, alt. 3200 ft., 20 Nov. 1964, *D. H. Nicolson 2020* (US).

PUERTO RICO: Sierra de Luquillo, south of La Mina toward Florida, alt. 500 m, 16 Jan. 1961, *J. Renz 9951* (Herb. J. Renz); East Peak area, Feb. 1962, *R. O. Woodbury s.n.* (UPR); El Toro Trail, El Yunque, 29 Jan. 1963, *R. O. Woodbury s.n.* (UPR); Luguillo Mts., west peak, 25 July 1966, *R. A. Howard 16155* (AMES); Pico del Este, terrestrial on clay bank, alt. ca 1010 m, 2 Nov. 1987, *J. D. Ackerman & A. Montalvo 2410* (UPRRP); Guavate, on banks, alt. 500 m, 18 May 1989, *A. & P. Liogier & L. F. Martorell 36759* (UPR); Cerro La Santa, terrestrial on clay bank, alt. 860 m, 14 Feb. 1989, *J. D. Ackerman 2483* (UPRRP).

HAITI: Road from Camp No. 1 to La Barrière Couchant, alt. 2800 ft., 17 July 1905, *G. V. Nash & N. Taylor 1085* (NY).

VENEZUELA: Edo. Bolívar: Río Las Ahallas, alt. 850 m, 1 Nov. 1985, *R. Liesner 19270* (MO, VEN). Terr. Fed. Amazonas: Atures, 9 Km NW of Yutajé, alt. 1760 m, 7 Mar. 1987, *R. Liesner & B. Holst 21724* (AMES, MO, VEN); same area, near Jutaje, alt. 1100 m, 8 Mar. 1987, *R. Liesner & B. Holst 21778* (VEN, MO); Río Negro, Cerro Tamacuari, alt. 1400 m, Feb. 1989, *Santana & Gutierrez 43* (VEN).

ECUADOR: Prov. of Esmeraldas: terrestrial on road embankment west of Lita, alt. 850 m, 28 Dec. 1990, *C. H. Dodson, T. Neudecker & H. Volles 18588* (MO), C. Luer illustr. 15269.

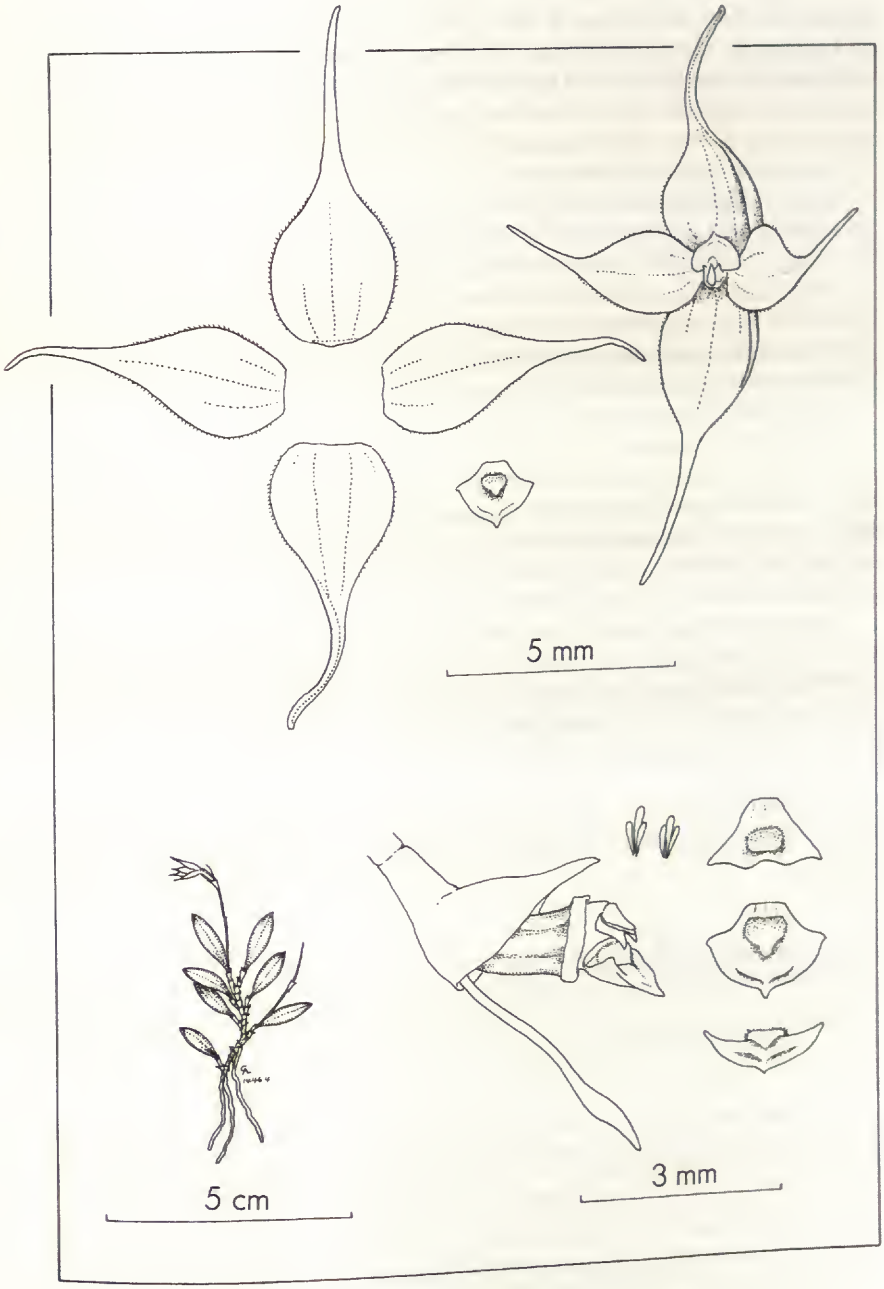


Plate 40. *Brachionidium parvum* Cogn.

The aptly named *B. parvum* is widely distributed at relatively low altitudes of both the Greater and Lesser Antilles, Venezuela, and Ecuador. Four different collections were cited by Cogniaux in the original description. The first is a collection by Harris of *B. syme-morrisii* from Mt. Moses, Jamaica; the second is a sterile collection by Duss (*Duss 3730*) from Guadeloupe (not Martinique); and the third and fourth collections are by Broadway from Grenada. Congiaux's description applies to the last two collections, and not to either the Jamaican collection, nor to the sterile collection from Guadeloupe.

The Grenadan collection of *W. E. Broadway 268* at Kew has been designated as the lectotype of *B. parvum* instead of the Guadeloupean collection of *Duss 3730* at New York indicated by Garay, because Cogniaux's description applies to the Broadway collection, and because the Duss collection is without flowers. Because *Duss 4149* from Guadeloupe, the type of *B. dussii*, has been lost at B, a recent collection from Guadeloupe has been designated as a neotype. These small-flowered plants from Guadeloupe are indistinguishable from *B. parvum*.

Garay (1956) reduced *B. longicaudatum* to the synonymy of *B. parvum*, apparently basing his conclusion on vegetative similarities of *B. longicaudatum* from the mountains of Amazonian Venezuela and the sterile collection from Guadeloupe by Duss. *Brachionidium longicaudatum* is distinguished by the small but stout, erect habit; tails of the sepals and petals longer than the blades; and an acutely deflexed lip, the disc of which is mostly covered by a broad, pubescent callus. Garay (1956) published drawings of *B. longicaudatum* under the name of *P. parvum*.

Brachionidium parvum is distinguished by the very small, erect habit; either purple or yellow sepals and petals less than one centimeter long including the acuminate, tail-like apex; and a minute, transversely trapeziform, obtuse lip with a pubescent callus. It is very similar to a small form of *B. sherringii*, and was considered a variety of that species by Stehlé. Forms intermediate between *B. parvum* and *B. sherringii* occur.

The recent discovery of essentially identical plants in western Ecuador would seem to indicate that this species is more widely distributed in South America than thought.

Brachionidium peltarion Luer, sp. nov.

Ety.: From the Greek *peltarion*, "a little shield," referring to the shape of the lip.

Planta parva, rhizomate suberecto, foliis ellipticis quinque-nernatis, flore parvo luteo, sepalo mediano synsepaloque eciliatis brevicaudatis, petalis eciliatis late ovatis obliquis brevicaudatis, labello late ovato supra medium peltato obtuso infra medium acute deflexo marginibus integris callo subnullo.

Plant small, epiphytic, suberect to erect, up to 6 cm tall, the rhizomes stout, occasionally branching, 3-4 mm long between ramicauls, enclosed by 2-3 imbricating, mucronate sheaths; roots slender from nodes near the base. Ramicauls suberect, 5-6 mm long, enclosed by 2 mucronate sheaths. **Leaf** erect to suberect, coriaceous, elliptical, acute, apiculate, 12-15 mm long including the petiole 1-2 mm long, 5-7 mm wide, 5-veined, cuneate below into the petiole. **Inflorescence** a solitary, yellow-green, resupinate flower borne by an erect, slender peduncle 16-22 mm long, with a bract near the middle; floral bract long-mucronate, 3 mm long, enclosing the pedicel and part of the ovary; pedicel 0.5 mm long, with a protruding filament 4 mm long; ovary 2 mm long; **sepals** eciliate, the middle sepal obovate, 5 mm long, 3 mm wide, the apex abruptly acuminate with a tail 1 mm long, 3-veined, the lateral sepals connate into an ovate, acute, concave synsepal, 6 mm long including a tail 1 mm long, 3 mm wide expanded, 2-veined; **petals** ovate, oblique, obtuse, acuminate, eciliate, 5 mm long including a tail 1 mm long, 2.5 mm wide, 3-veined; **lip** transversely subcordate, 1.5 mm long, 1.8 mm wide, with narrowly obtuse lateral angles, the apex rounded, obtusely apiculate, acutely deflexed near the middle, slightly convex above the middle, minimally thickened near the middle, microscopically cellular pubescent below the middle, the base broadly hinged to the column-foot; **column** stout, 0.5 mm long, 1 mm broad; pollinia 6.

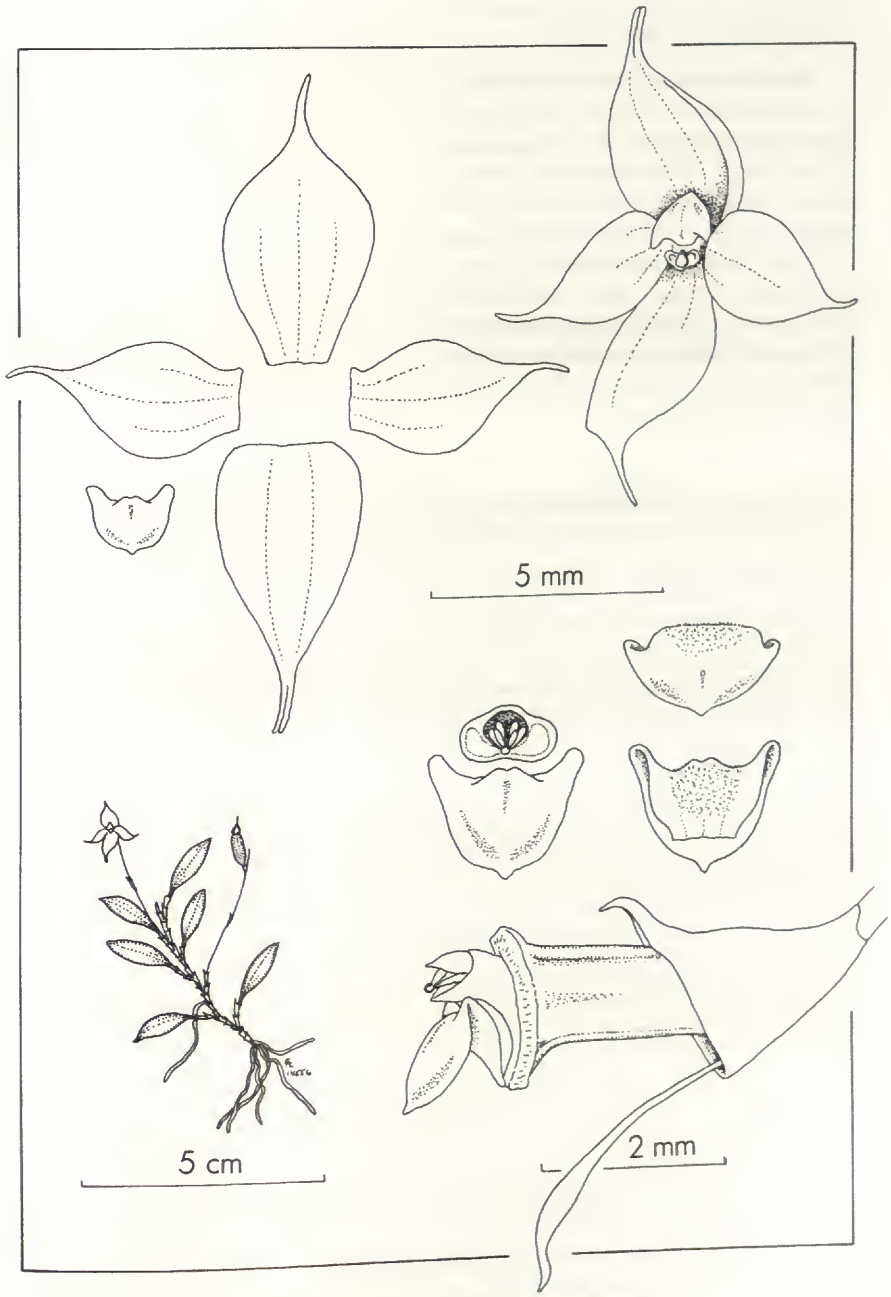


Plate 41. *Brachionidium peltarion* Luer

PANAMA: Prov. Coclé: Cerro Gaital, mesa north of El Valle de Antón, near western peak, alt. ca. 900 m, 14 Mar. 1981, *R. L. Dressler & E. Hagsater 6005* (Holotype: MO), C. Luer illustr. 14556.

This little species is known only from a single collection by Dressler in the mountains of central Panama. It is characterized by the small, suberect habit; a small, yellow-green flower; tails of eciliate sepals and petals only 1 mm long; and an acutely deflexed, shield-shaped, obtuse lip that is essentially without a callus. The deflexed, basal portion of the lip is microscopically pubescent, reminiscent of the more coarse pubescence on the deflexed portion of the lip of *B. longicaudatum*.

Brachionidium phalangiferum Garay, Canad. J. Bot. 34: 738, 1956.

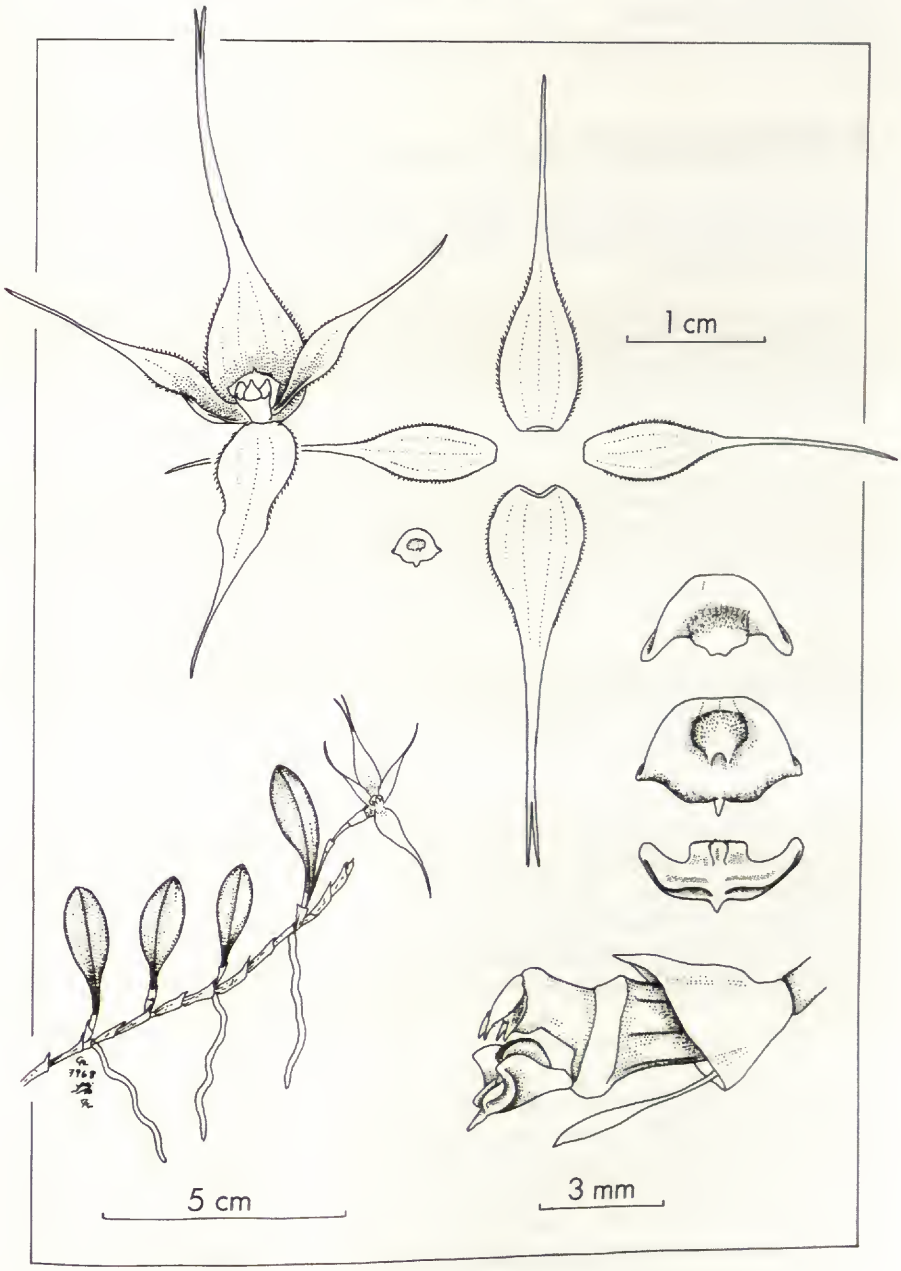
Ety.: From the Latin *phalangiferus*, "spider-bearing," referring to the spiderlike flowers.

Plant small to medium in size, epiphytic, long-repent, the rhizome relatively stout, up to 20 or more cm long, 10-25 mm long between ramicauls, each segment enclosed by 3 imbricating, shortly mucronate sheaths; roots fleshy, one from a node. Ramicauls suberect, 5-8 mm long, enclosed by 2 similar sheaths. **Leaf** erect, coriaceous, 15-30 mm long including the 3-6 mm long petiole, the blade elliptical, subacute to obtuse, apiculate, 7-10 mm wide, the base cuneate. **Inflorescence** a solitary, non-resupinate flower borne by an erect, slender peduncle 15-20 mm long, with a loose bract below the middle and at the base, from near the apex of the ramicaul; floral bract inflated, mucronate, 5 mm long; pedicel 1 mm long, with a filament 6 mm long; ovary 4 mm long; **sepals** bright purple, with the tips of the tails yellow, shortly ciliate, the middle sepal elliptical, acute, acuminate, long-caudate, 25 mm long including the filiform tail 13 mm long, 6 mm wide, 3-veined, the lateral sepals completely connate to 5 mm of the tip of the tail into an ovate, acute, acuminate, long-caudate synsepal, 26 mm long including the filiform tail 15 mm long, bifid at the apex, 7 mm wide, 4-veined; **petals** bright purple, shortly ciliate, elliptical, slightly oblique, 23 mm long including the filiform tail 12 mm long, 4 mm wide, 3-veined; **lip** transversely trapeziform from above, transversely cordate from in front, 2.5 mm long, 4 mm wide, 1 mm deep, the lateral angles conduplicate, obtuse, the apex broadly rounded, shortly apiculate, the margin deeply bimarginate with the upper margin overhanging the shorter lower margin, the disc with an ovoid, bifid, minutely pubescent callus; **column** stout, 2.5 mm long; pollinia 6, free.

VENEZUELA: Edo. Mérida: between Santa Cruz de Mora and El Molino, alt. 2400 m, 12 Nov. 1949, *J. Renz 6106 (Holotype: Herb. J. Renz).*
COLOMBIA: Dept. of Norte de Santander: Munic. of Toledo, Alto de Mefué, epiphytic in cloud forest, alt. 2600 m, 25 May 1982, *C. Luer, R. Escobar & D. Portillo 7968 (SEL).*

This long-repent species is found growing in damp, mossy humus of cloud forests in the Eastern Cordillera of Colombia and adjacent western Venezuela where it was first discovered by Dr. Jany Renz.

The erect, elliptical leaves are produced at intervals of 1.5-2 centimeters along the rhizome. The bright purple,


1 cm
5 cm
3 mm

long-tailed sepals and petals are minutely ciliate. The margin of the transverse lip is deeply cleft longitudinally into two margins, the uppermost overhanging and obscuring the lower margin.

Brachionidium piuntzae Luer, sp. nov.

Ety.: Named for Río Piuntzae in southeastern Ecuador where this species was discovered.

Planta mediocris erecta rhizomate crasso vaginis glabris longi-mucronatis, foliis ellipticis 7-nervatis, flore translucenti flavescenti ecaudato, sepalo mediano ovato acuto, synsepalo late elliptico obtuso, petalis falcatis acutis, labello transverse ovato, angulis lateralibus obtusis, apice late rotundo breviter apiculato, callo bifurcato pubescenti.

Plant medium in size, epiphytic, erect to suberect, up to 20 cm tall, the rhizome relatively stout, occasionally branching, 6-9 mm long between ramicauls, enclosed by 2-3 tubular, long-mucronate sheaths; roots coarse, fleshy, from near the base. Ramicauls suberect, 4-5 mm long, enclosed by 2 tubular, long-mucronate sheaths. **Leaf** erect or suberect, coriaceous, elliptical, acute, 20-25 mm long including a petiole 2-3 mm long, 7-10 mm wide, 7-veined, cuneate below into the petiole. **Inflorescence** a large, solitary, non-resupinate, translucent yellow-green flower borne by a slender, erect peduncle 20-25 mm long, with a bract near the middle, from near the apex of the ramicaul; floral bract inflated, acute, mucronate, 4 mm long, enclosing the pedicel and part of the ovary; pedicel 1.5 mm long, with a filament 3 mm long; ovary 2-4 mm long; **sepals** glabrous, the middle sepal ovate, acute, 15 mm long, 7.5 mm wide, the lateral sepals connate into a broadly ovate synsepal, 17 mm long, 11 mm wide, 4-veined, the apex obtuse, contracted into an apiculum less than 1 mm long; **petals** microscopically ciliate, falcate, oblique, acute, 15 mm long, 4 mm wide, 3-veined; **lip** yellow-green, transversely ovate, 3 mm long, 5 mm wide, the lateral angles obtuse, the apex broadly rounded, with a minute apiculum, with carinae behind and parallel to the margin, the disc with a flat, ovate, bifid, pubescent callus; **column** stout, 2 mm long, 6 pollinia.

ECUADOR: Prov. of Morona-Santiago: Cordillera del Condor, epiphytic in forest at the headwaters of Río Piuntza, alt. 1850 m, 5 Jan. 1972, *B. MacBryde 975* (Holotype: AMES), C. Luer illustr. 14725.

This species is known only from the type-collection made by Bruce MacBryde in the Cordillera del Condor before any roads penetrated the area. However, even though the Condor is now penetrated by several roads that have permitted extensive collecting, this species has not been rediscovered.

Restrepia piuntzae is distinguished by the erect habit; large, tailless, translucent yellow-green flowers; falcate petals; and a transversely ovate lip not unlike that seen in many other species. Perhaps the most closely allied species is the Ecuadorian *B. andreettae*, from which it is distinguished by the obtuse, non-cucullate synsepal, and sigmoid-shaped petals.

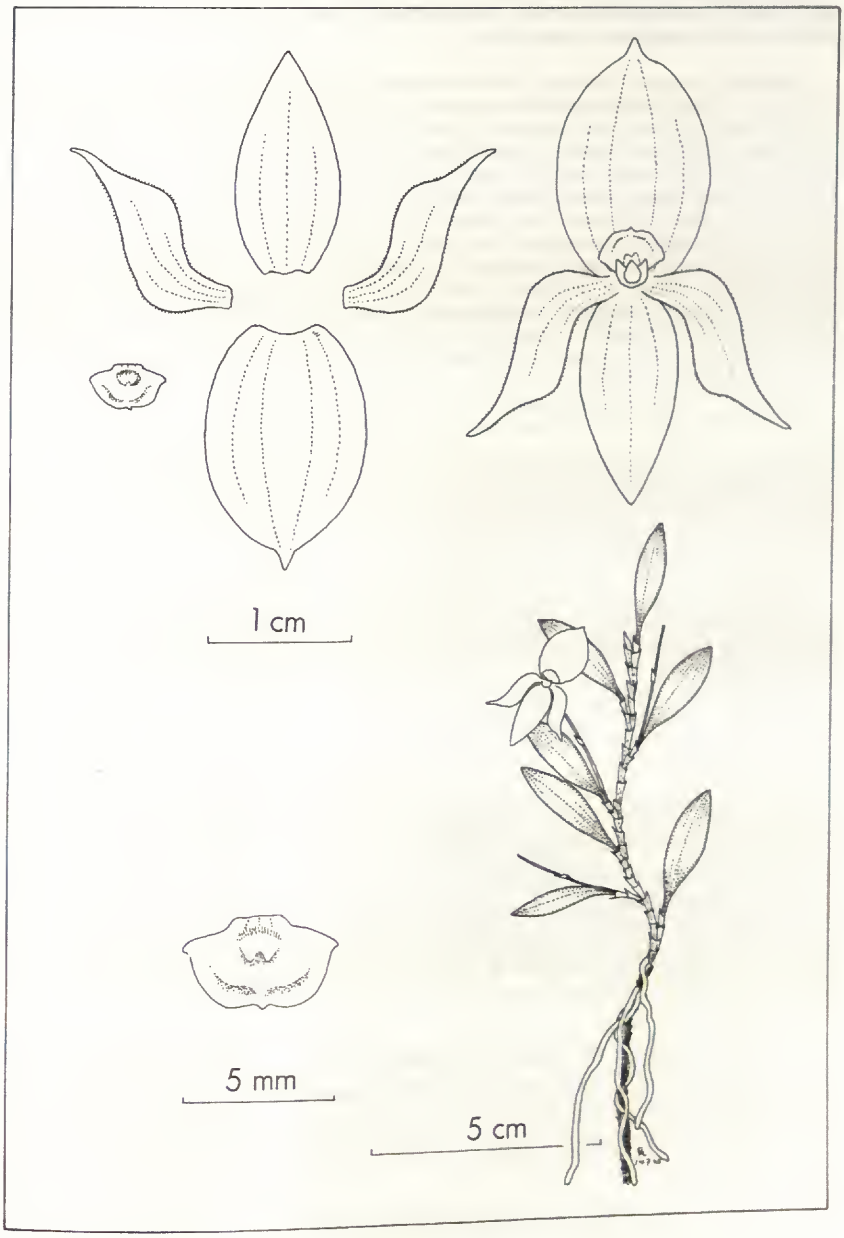


Plate 43. *Brachionidium piuntzae* Luer

Brachionidium polypodium Luer, sp. nov.

Ety.: From the Greek *polypodion*, "many-footed," and the creeping ferns that resemble this species.

Planta parva longirepens rhizomate crasso, foliis parvis late ellipticis pedunculo brevioribus, sepalo impari synsepalo petalisque minute ciliatis ovatis acutis longicaudatis, petalis obliquis et labello transverse trapeziformi margine antico rotundato tenui.

Plant small, epiphytic, long-repent, the rhizome comparatively stout, occasionally branching, up to 30 cm long or longer, 7-10 mm long between ramicauls, each segment with 3 loose, mucronate sheaths; roots produced singly from a node along the rhizome. Ramicauls suberect, 2-3 mm long, enclosed by 2 similar sheaths. **Leaf** erect, coriaceous, broadly elliptical, subacute to obtuse, apiculate, 7-13 mm long, 5-9 mm wide, 7-veined, cuneate below to a petiole 1-2 mm long. **Inflorescence** a solitary, small, non-resupinate flower, borne by an erect, filiform peduncle 14-16 mm long, with a bract below the middle and at the base, from near the apex of the ramicaul; floral bract infundibular, mucronate, 3 mm long, enclosing the pedicel and ovary; pedicel 0.5 mm long, with a filament 3 mm long; ovary 1.5 mm long; **sepals** translucent maroon, shortly ciliate, the middle sepal ovate, acute, acuminate, caudate, 12 mm long including the filiform tail 6 mm long, 3.5 mm wide, barely 3-veined, the lateral sepals connate into an ovate, concave, acute, acuminate, caudate synsepal, 11 mm long including the forked, filiform tail 5 mm long, 4 mm wide expanded, 2-veined; **petals** translucent maroon, shortly ciliate, ovate, oblique, acute, acuminate, caudate, 8.5 mm long including the filiform tail 4 mm long, 2.75 mm wide, 1(2)-veined; **lip** transversely trapeziform, 1.25 mm long, 2.25 mm wide, the lateral angles subacute, the apex broadly rounded with thin margins, shortly obtusely apiculate, the disc with an ovoid, minutely pubescent callus, with a small glenion; **column** stout, 0.5 mm long, bidentate; pollinia 6.

PANAMA: Prov. of Chiriquí: Cerro Colorado, alt. 1400 m, growing in dense moss on side of tree, 25 July 1979, *T. Antonio 1413* (Holotype: MO), C. Luer illustr. 14376; Cerro Colorado, alt. 1300 m, 19 Aug. 1975, *R. L. Dressler 5128* (MO); Camp Hornito, Fortuna dam site, alt. 1200-1500 m, 16 Aug. 1976, *R. L. Dressler 5412* (MO). Prov. of Bocas del Toro: trail bordering Chiriquí near the Fortuna dam, alt. 1200-1300 m, 23 Dec. 1986, *G. McPherson & J. Aranda 10066* (MO).
COSTA RICA: Prov. of Heredia: Atlantic slope of Volcán Barva, primary forest along Río San Rafael, alt. 1500 m, 9 Nov. 1986, *M. H. Grayum, C. Haufler & M. Roos 7759* (MO).

Vegetatively this little species resembles very much one of the tiny, creeping, round-leaved ferns so often encountered in similar, mossy habitats in the tropics. It also resembles some species of peperomias. It is apparently endemic in Costa Rica and western Panama where it was first collected by Dressler.

Among the other long-repent, very small species, *B. polypodium* is distinguished by the relatively stout, creeping rhizome that produces evenly spaced, short ramicauls with a little, elliptical leaf. The flowers are small with minutely ciliate sepals and petals that are slender-caudate. The lip is transverse with a broadly rounded, entire margin.

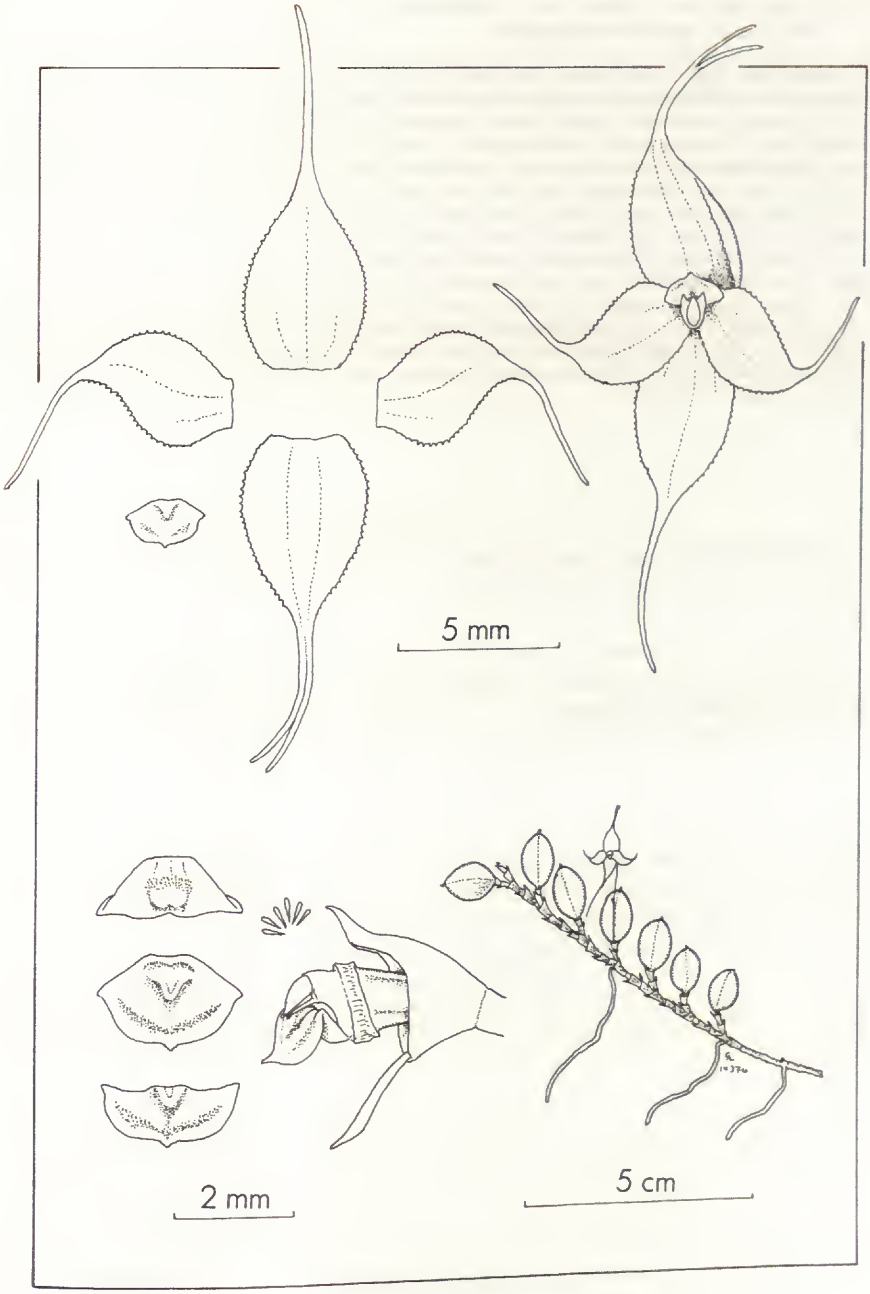


Plate 44. *Brachionidium polypodium* Luer

Brachionidium portillae Luer, Lindleyana 1: 176, 1986.

Ety.: Named in honor of Mario Portilla, at that time the curator of orchids at Hostería Uzhupud, Paute, Ecuador, who discovered this species.

Plant small, epiphytic, the rhizome stout, erect, up to 4 cm tall, 3-4 mm long between ramicauls, enclosed by 2-3 loosely fitting, imbricating, mucronate sheaths, rooting from the base. Ramicauls suberect, 2-3 mm long, enclosed by 2 similar sheaths. **Leaf** suberect, thickly coriaceous, 10-15 mm long including the 2-3 mm long petiole, the blade elliptical, subacute, 5-6 mm wide, 5-veined, the base cuneate. **Inflorescence** a solitary, non-resupinate, yellow flower borne by an erect, slender peduncle 15-35 mm long, with a bract near the middle and at the base, from near the apex of the ramicaul; floral bract inflated, mucronate, 3 mm long; pedicel 0.5 mm long, with a filament 5 mm long; ovary 1.5 mm long; **sepals** eciliate, the middle sepal elliptical, acute, acuminate, shortly caudate, 13 mm long, 4.25 mm wide, 3-veined, the lateral sepals completely connate into a broadly elliptical, concave synsepal, 13 mm long, 5 mm wide, 4-veined, the apex obtuse, contracted into a tail about as long as the blade; **petals** eciliate, oblong, oblique, 13 mm long, 3 mm wide, 3-veined, the acute apex acuminate into a tail about as long as the blade; **lip** transversely trapeziform from above, transversely cordate from in front, 1.75 mm long, 2.25 mm wide, the lateral angles obtuse, each with a minute apiculum, the apex rounded, apiculate, the margins callous, the disc with a flat, minutely pubescent callus with a glenion anteriorly; **column** stout, 1 mm long, with 6 pollinia.

ECUADOR: Prov. of Morona-Santiago: collected by Mario Portilla in the Cordillera de Cutucú, flowered in cultivation at the Orquideario of Uzhupud, 8 April 1985, *C. Luer 11130* (Holotype: MO).

Mario Portilla recently discovered this species in a remote part of the Cordillera de Cutucú of southeastern Ecuador, and cultivated it at the orquideario at Uzhupud near Paute. To my knowledge, it is not known from another collection.

From the other species of the genus characterized by a small, erect habit, *B. portillae* is distinguished by the combination of the following morphological features: a short, stout, erect habit; a long-pedicellate, yellow flower with eciliate, short-tailed sepals and petals; and a thickly cordate, narrowly bimarginate lip.

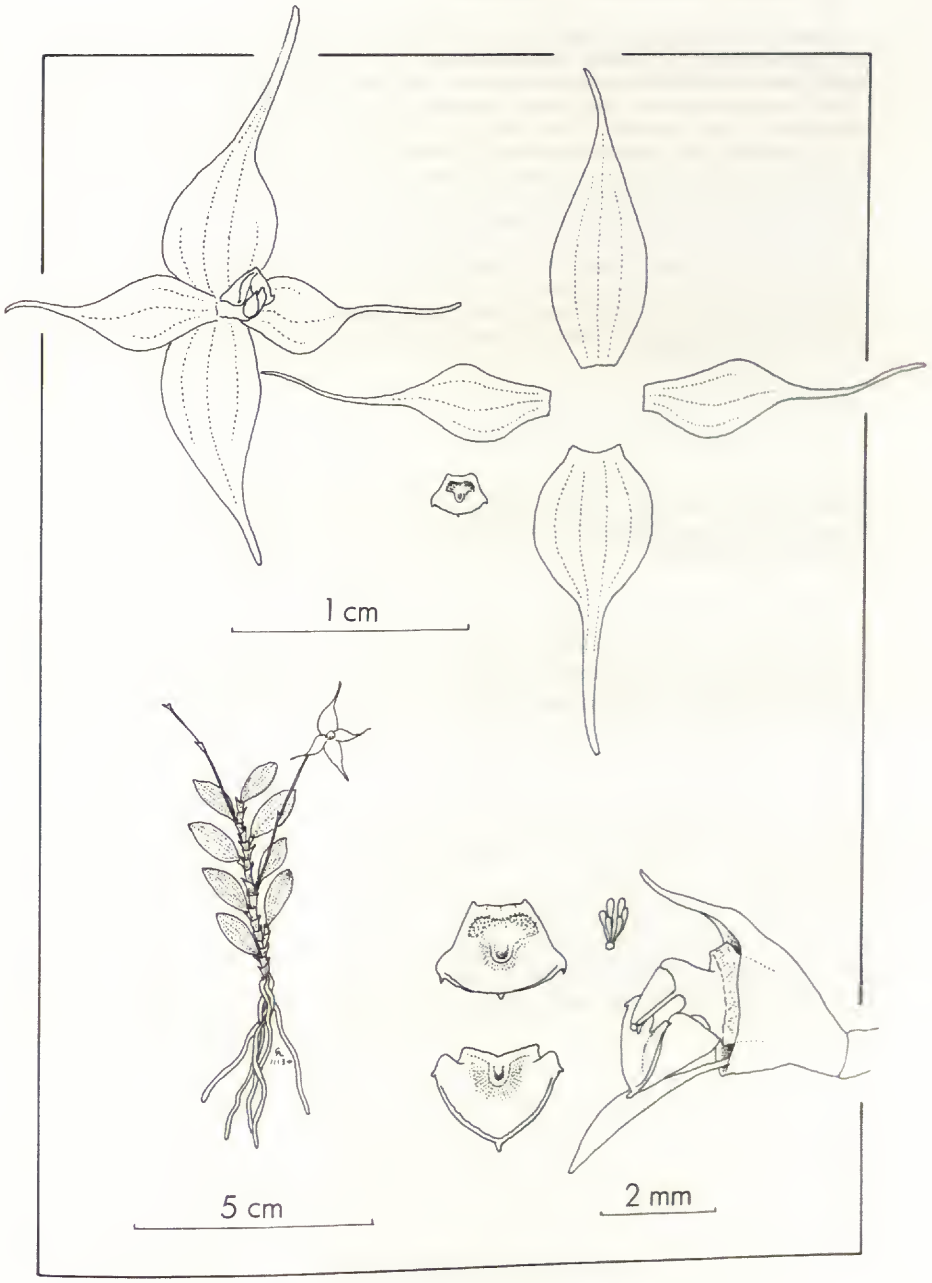


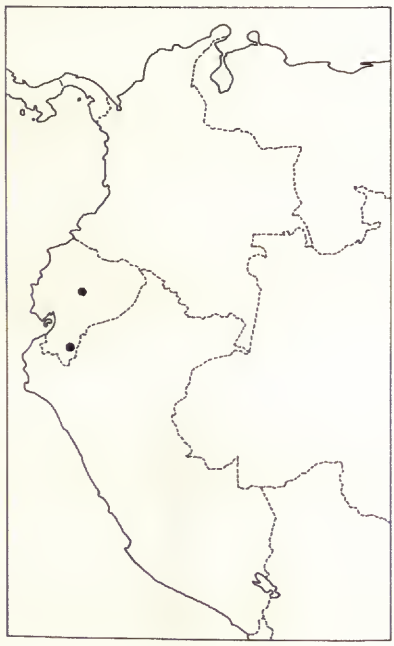
Plate 45. *Brachionidium portillae* Luer

Brachionidium pteroglossum Luer, Phytologia 55: 176, 1984.

Ety.: From the Greek *pteroglossa*, "a winged tongue," referring to the lateral lobes of the lip.

Plant small to medium in size, epiphytic, the rhizome erect, occasionally branching, stout, 2 mm thick, up to 30 cm tall, 8-10 mm long between ramicauls, each segment enclosed by 3 imbricating, abruptly mucronate sheaths; roots coarse, from the base. Ramicauls suberect, 5-7 mm long, enclosed by 2 abruptly mucronate sheaths. **Leaf** suberect, coriaceous, elliptical, acute, apiculate, 15-20 mm long including the 2-3 mm long petiole, 4-6 mm wide, 5- to 7-veined, the base cuneate. **Inflorescence** a solitary, non-resupinate flower borne by an erect, slender peduncle 12-22 mm long, with a loose bract below the middle and at the base, from near the apex of the ramicaul; floral bract infundibular, mucronate, 3 mm long, enclosing the pedicel and ovary; pedicel 1 mm long, with a filament 3 mm long; ovary 2 mm long; **sepals** greenish white with 3 purple stripes, minutely and sparsely ciliate, the middle sepal ovate, acute, acuminate, 12 mm 4.25 mm wide, 3-veined, the lateral sepals completely connate into an ovate, acute synsepal, 12 mm long, 4.75 mm wide, 4-veined; **petals** greenish white with a purple stripe, shortly ciliate, elliptical, oblique, acute, acuminate, 11.5 mm long 3 mm wide, 3-veined; **lip** transversely triangular, 2 mm long, 4 mm wide, the lateral angles acute, incurved, the apex broadly rounded, shortly apiculate, the margins callous, the disc with a low, flat, ovoid, minutely pubescent callus; **column** stout, 1.5 mm long, bidentate; pollinia 8.

ECUADOR: Prov. of Zamora-Chinchipe: epiphytic in moss in forest south of Yangana, alt. 2400 m, 30 Jan. 1980, *D. D'Alessandro 80-001* (Holotype: SEL); south of Yangana above Valladolid, alt. 2450 m, 23 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10934* (MO). Prov. of Pastaza: epiphytic in cloud forest along Río Zuñag, alt. 2700 m, *A. Hirtz, S. Dalström et al. 4636* (MO).



This species climbs erect in mossy debris among scrubby vegetation in wet, cloud forests in central and southern Ecuador at relatively high altitudes. The rhizome is stout, rooting at the base and is occasionally branching. The pale green, purple-striped sepals and petals are narrow, acuminate and minutely ciliate. The lateral lobes or angles of the lip are acute and winglike.

In habit, *B. pteroglossum* most closely resembles *B. simplex* and *B. tetrapetalum*, but it is distinguished from them by the narrow sepals and petals, and winglike, lateral angles of the lip.

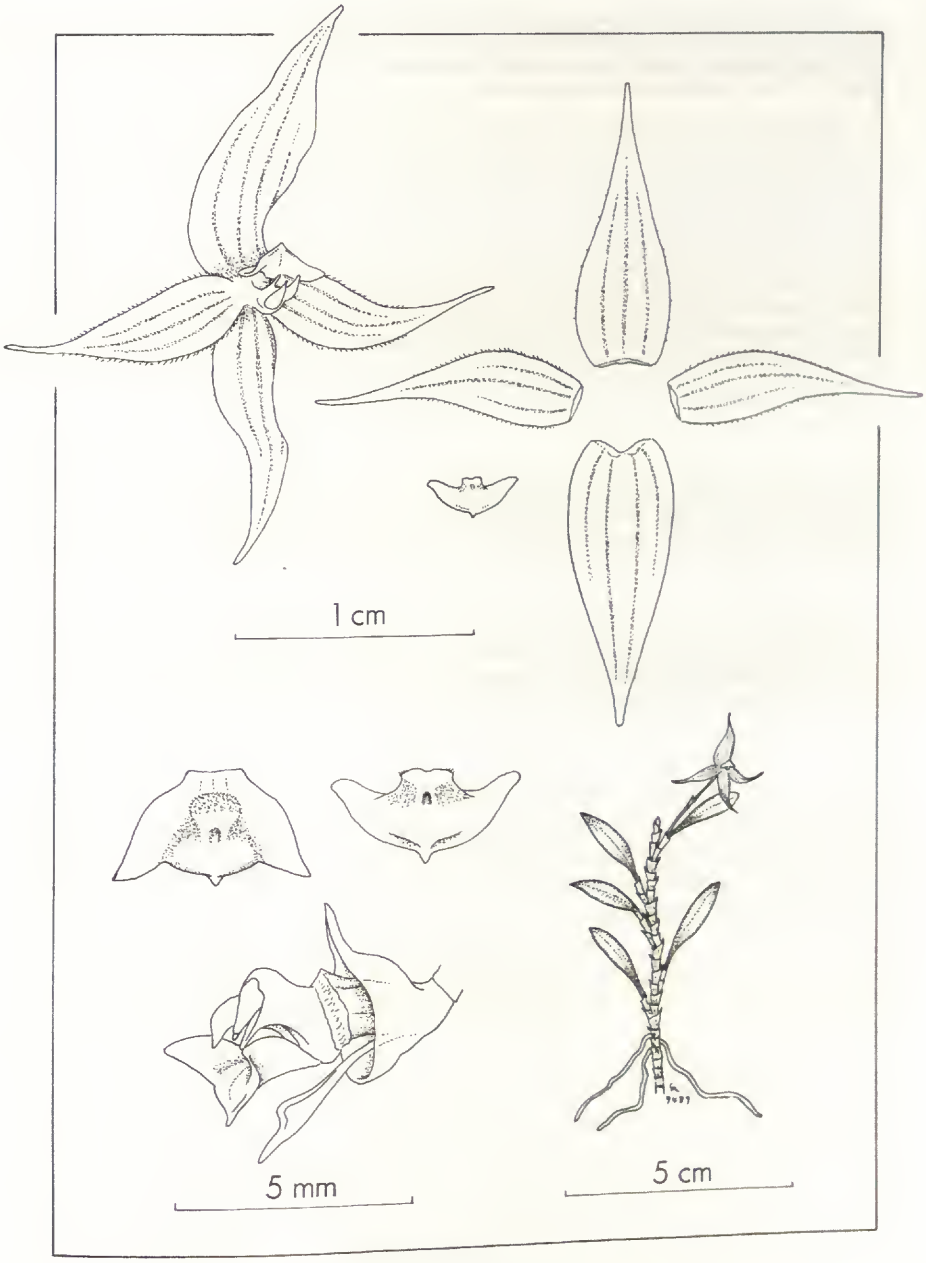


Plate 46. *Brachionidium pteroglossum* Luer

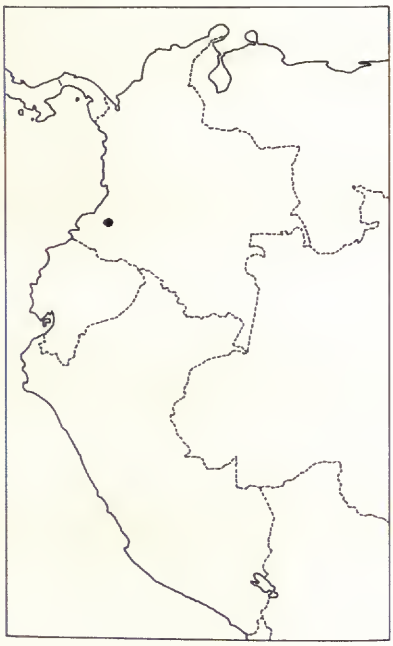
Brachionidium puraceënse Luer, sp. nov.

Ety.: Named for the Páramo de Puracé in southern Colombia where this species was discovered.

Planta mediocris longirepens vaginis glabris mucronatis semotis, foliis ellipticis acutis 7-nervatis, flore rubro ecaudato, sepalo synsepaloque ciliatis late ovatis acutis leviter acuminatis, petalis ciliatis ovatis acutis acuminatis, labello transverse ovoideo marginibus laticarinatis, angulis lateribus obtusis, apice late obtuso triapiculato, callo magno pubescenti.

Plant medium in size, epiphytic, long-repent, 20-40 cm long, the rhizome relatively slender, occasionally branching, 3-4 cm long between ramicauls, enclosed by 3 distant, tubular, mucronate sheaths; roots fleshy, from nodes on the rhizome. Ramicauls suberect, 5-8 mm long, enclosed by 2 tubular, mucronate sheaths. **Leaf** erect or suberect, coriaceous, elliptical, acute, apiculate, 2-3 cm long including a petiole 2-4 mm long, 6-9 mm wide, 7-veined, cuneate below into the petiole. **Inflorescence** a solitary, non-resupinate, fire-red flower borne by a slender, erect peduncle 17-20 mm long, with a bract near the middle, from near the apex of the ramicaul; floral bract inflated, acute, 4 mm long, enclosing the pedicel and part of the ovary; pedicel 1.5 mm long, with a filament 5 mm long; ovary 3 mm long; **sepals** ciliate below the middle, the middle sepal ovate, concave, acute, lightly acuminate, 9 mm long, 5 mm wide, the lateral sepals connate into an ovate, acute, lightly acuminate synsepal, 9 mm long, 4 mm wide, 2-veined; **petals** conspicuously ciliate, ovate, acute, acuminate, 9 mm long, 4 mm wide, 1-veined; **lip** transversely ovate, 3 mm long, 4.5 mm wide expanded, the marginal angles obtuse, the margins longitudinally and prominently carinate, the apex broadly rounded, shortly triapiculate, the disc with a comparatively large, pubescent callus above the base; **column** stout, 1 mm long, pollinia 8.

COLOMBIA: Dept. of Valle del Cauca: Parque Nacional Natural de Purecé, around Laguna de la San Rafael, alt. 3300 m, 6 Oct. 1984, *G. Lozano, O. Rangel, L. F. de Turbay, A. Sanabria & N. Espejo 4697* (Holotype: COL), C. Luer illustr. 14808.



This species is apparently endemic in the Páramo de Puracé of southern Colombia where it was discovered by G. Lozano and companions. It is most closely related to Ecuadorian *B. ecuadorense*. Both species are long-creeping with tailless flowers, but *B. puraceënse* is distinguished by the prominently ciliate petals and a proportionately large, transverse lip with protruding, marginal carinae ending in a rounded but triapiculate apex.

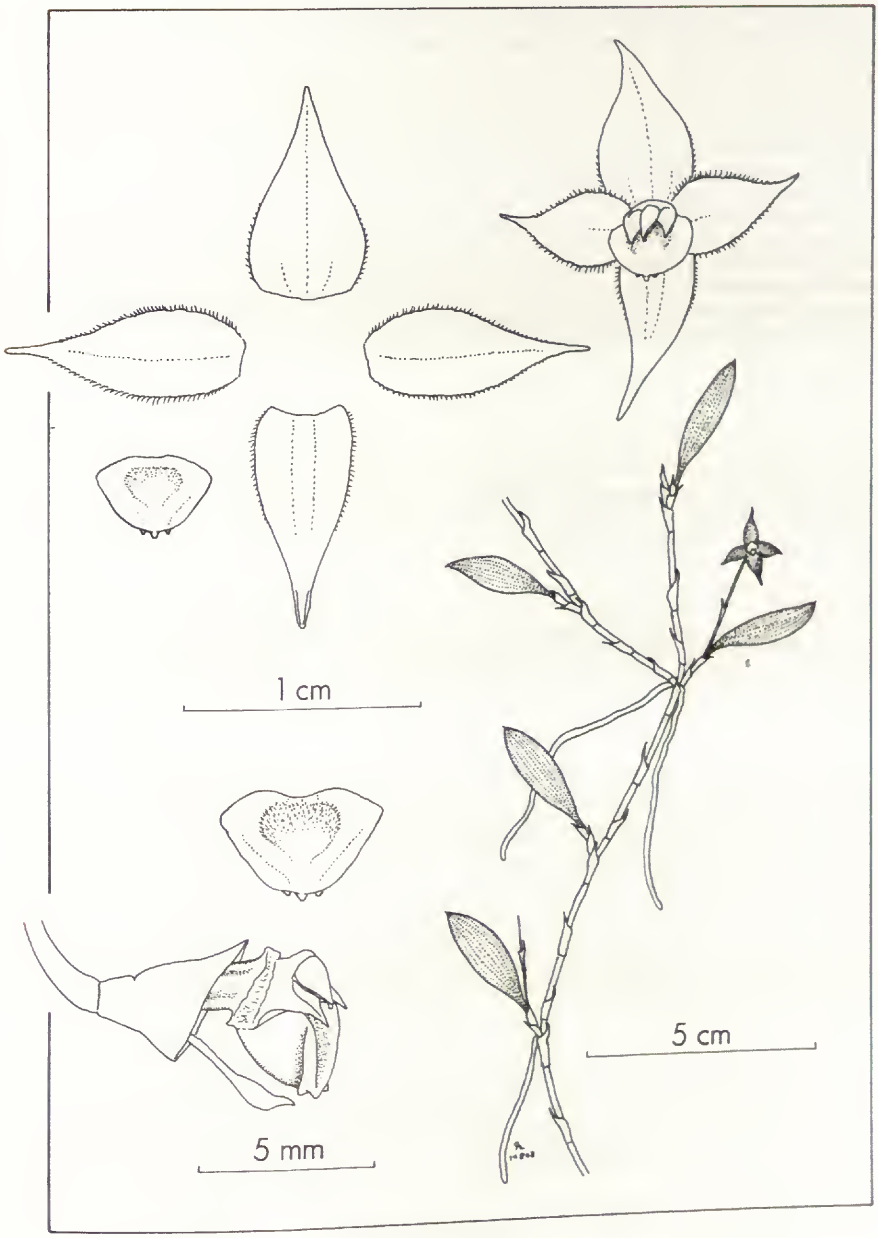


Plate 47. *Brachionidium puraceënse* Luer

Brachionidium pusillum Ames & Schweinf., Sched. Orch. 10: 52, 1930.

Ety.: From the Latin *pusillus*, "very small," referring to the habit of the plant.

Plant very small, epiphytic, long-repent, the rhizome slender, occasionally branching, up to 10 cm long or longer, 5-12 mm long between ramicauls, each segment with 3 shortly mucronate sheaths; roots produced singly from a node. Ramicauls suberect, 1.5 mm long, enclosed by 2 similar sheaths. **Leaf** erect, coriaceous, elliptical, obtuse, bidentate and apiculate at the apex, 5-10 mm long, 2.5-4 mm wide, 5-veined, cuneate below to the base. **Inflorescence** a solitary, small, resupinate flower comparatively large for the plant, borne by an erect, slender peduncle 6-8 mm long, with a loose bract below the middle and at the base, from near the apex of the ramicaul; floral bract infundibular, acute, 1.5 mm long, enclosing the pedicel and ovary; pedicel 0.4 mm long, with a filament 1.5 mm long; ovary 1 mm long; **sepals** translucent light yellow, sparsely short-ciliate, the middle sepal ovate, acute, acuminate, caudate, 6 mm long including the filiform tail 3 mm long, 1.8 mm wide, 1(3)-veined, the lateral sepals completely connate into a narrowly triangular, acute, acuminate, caudate synsepal, 6 mm long including the filiform tail 3 mm long, 1.5 mm wide, 2-veined; **petals** translucent light yellow, shortly ciliate, ovate, slightly oblique, acute, acuminate, caudate, 6 mm long including the filiform tail 3 mm long, 1.5 mm wide, 1(3)-veined; **lip** transversely trapeziform, 1.5 mm long, 2.5 mm wide, the lateral angles narrowly acute, erect, the apex oblong-truncate, concave, shortly apiculate, the disc with an ovoid, minutely pubescent callus, bifid or with a small glenion; **column** stout, 0.75 mm long, bidentate; pollinia 6.

COSTA RICA: Prov. of Heredia: Yerba Buena, northeast of San Isidro, alt. 2000 m, 22-28 Feb. 1926, *P. C. Standley & J. Valerio 49068* (Holotype: AMES; Isotype: US), *50250* (AMES, US). Prov. of Cartago: Pacuare-Matina, ca. 1867, *A. Endres 534* (W); Estrella, 24 July 1925, *C. H. Lankester 1015* (AMES); Estrella, alt. 5200 ft., 22 July 1932, *H. E. Stork 3298* (AMES). Prov. of Puntarenas: along the road to the Monteverde forest preserve, alt. 1500 m, 18 Mar. 1986, *C. Luer, J. Luer & D. Dod 12103* (MO).
PANAMA: Prov. of Chiriquí: above the Fortuna dam site, alt. 1100 m, 16 Feb. 1985, *C. Luer, J. Luer, R. Dressler & K. Dressler 10584* (MO). Prov. of Veraguas: Buenos Aires, ridge east of Cerro Tute, northwest of Santa Fe, 24 Dec. 1976, *R. L. Dressler 5546* (MO).

This tiny, long-repent species is found growing in damp, mossy humus of cloud forests in Costa Rica and western Panama. The first known collection was made by Endres in Costa Rica in the nineteenth century.

Most of the little, elliptical leaves are less than one centimeter in length and they are spaced about a centimeter apart on a threadlike rhizome. Although very small, the translucent, pale yellow, long-tailed flowers are large for the size of the plant. The sepals and petals are minutely ciliate with tails about as long as the blades. The large, triangular, lateral angles of the lip are lobelike, narrowly acute and erect.

Brachionidium pusillum is most similar to *B. minusculum* which is distinguished by smaller leaves spaced farther apart on the rhizome, glabrous petals, and a much smaller lip with shortly falcate lateral angles.

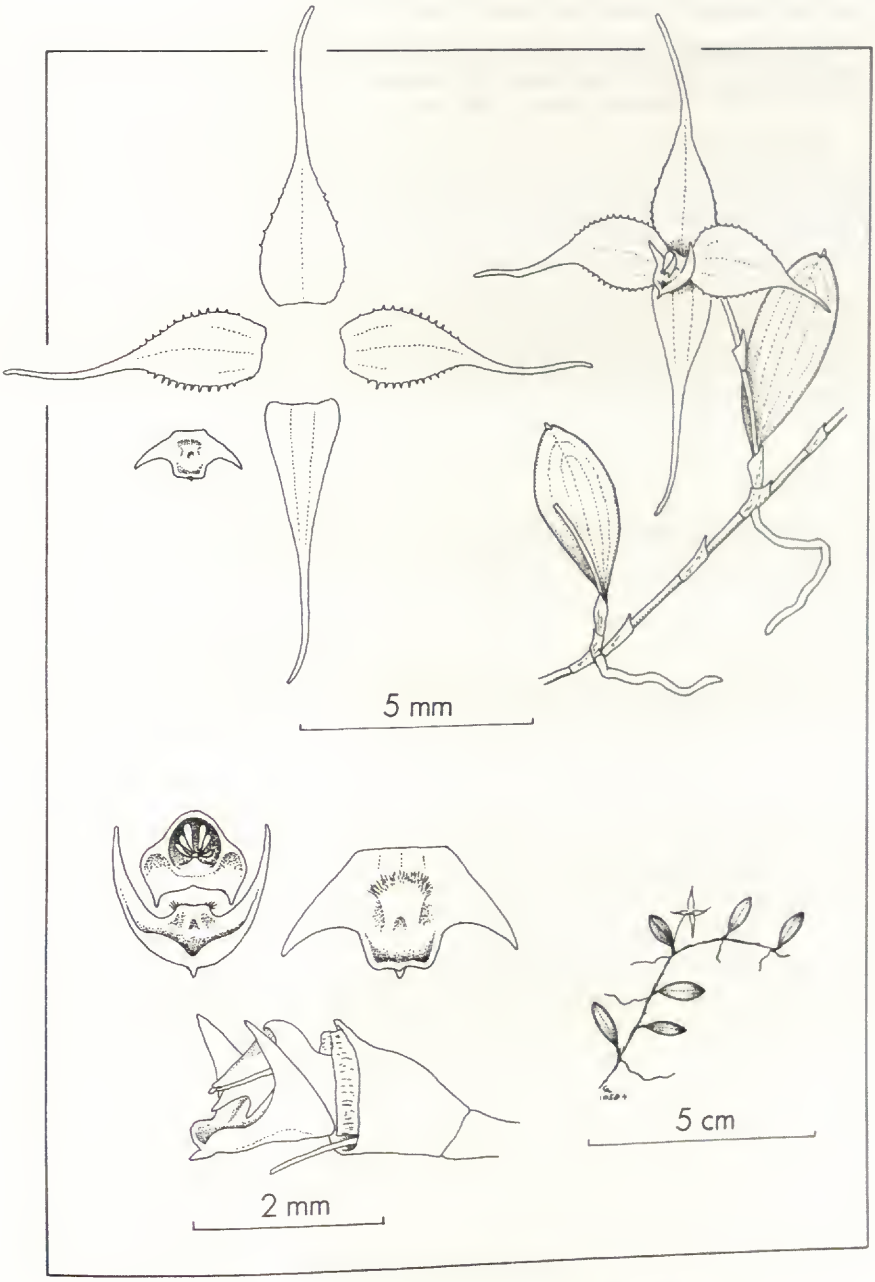


Plate 48. *Brachionidium pusillum* Ames & Schweinf.

Brachionidium renzii Luer, sp. nov.

Ety.: Named in honor of Dr. Jany Renz of Basel, Switzerland, who discovered this species as well as many others during one of his many travels through the northern Andes.

Planta parva rhizomate erecto vel suberecto, foliis ellipticis, flore luteo pro planta grande, sepalis petalisque minute ciliatis ovatis longicaudatis, labello subplano transverse peltato obtuso margine denticulata cum dentibus minutis infra marginem et callo humili.

Plant small, suberect to erect, up to 5 cm tall, the rhizomes stout, erect, 3-5 mm long between ramicauls, enclosed by 2 imbricating, ribbed, apiculate sheaths; roots slender from nodes near the base. Ramicauls suberect, 3-6 mm long, enclosed by 2 mucronate sheaths. **Leaf** erect to suberect, coriaceous, elliptical, acute, apiculate, 15-30 mm long including the petiole ca. 1 mm long, 4-8 mm wide, 7-veined, cuneate below into the petiole. **Inflorescence** a solitary, yellow, non-resupinate flower borne by an erect, slender peduncle 20-30 mm long, with a bract below the middle; floral bract long-mucronate, 3.5-4 mm long, enclosing the pedicel and part of the ovary; pedicel 1-1.5 mm long, with a protruding filament 3.5 mm long; ovary 3.5 mm long; **sepals** membranous, minutely ciliate, the middle sepal elliptical, 10 mm long, 6 mm wide, 3-veined, the apex acuminate into a slender tail 3-3.5 cm long, the lateral sepals connate into an ovate, acute, concave synsepal, the blade 10 mm long, 6.5 mm wide, 4-veined, the apex contracted into a slender tail 3-3.5 cm long, the tip bifid for about 7-8 mm; **petals** minutely ciliate, ovate, oblique, acute, acuminate, the blade 9 mm long, 4.5 mm wide, 3-veined, contracted into a slender tail 25-27 mm long; **lip** transversely peltate, 2 mm long, 4 mm wide, with subacute lateral angles, the apex broadly rounded, denticulate, with a row of minute denticles below the margin, the disc with a central, low, flat, rounded, pubescent callus, the base shortly reflexed, hinged to the column-foot; **column** stout, 1 mm long, 2 mm broad; pollinia 6.

GUYANA: Upper Mazaruni district, north slope of Roraima, alt. 2000-2300 m, 14-17 Feb. 1985, *S. R. Gradstein, J. Renz, H. J. Sipman & A. Aptroot 14414* (Herb. J. Renz), C. Luer illustr. 17738; same collection data, *S. R. Gradstein, J. Renz, H. J. Sipman & A. Aptroot 14060* (Herb. J. Renz).

This little species was discovered by Dr. Renz on an expedition to Mt. Roraima in 1985. It is related to *B. julianii* from adjacent Venezuela, but differs in the much larger habit and flowers. In outline the sepals and petals are similar. Although the lip of the only specimen of *B. julianii* is poorly preserved, the lip of *B. renzii* is obviously twice broader with a minutely denticulate margin. The lip of *B. julianii* has a double, denticulate margin.

In habit *B. renzii* resembles Central American *B. folsomii*, but the lip of the latter is geniculate with a deflexed base and incurved lateral angles.

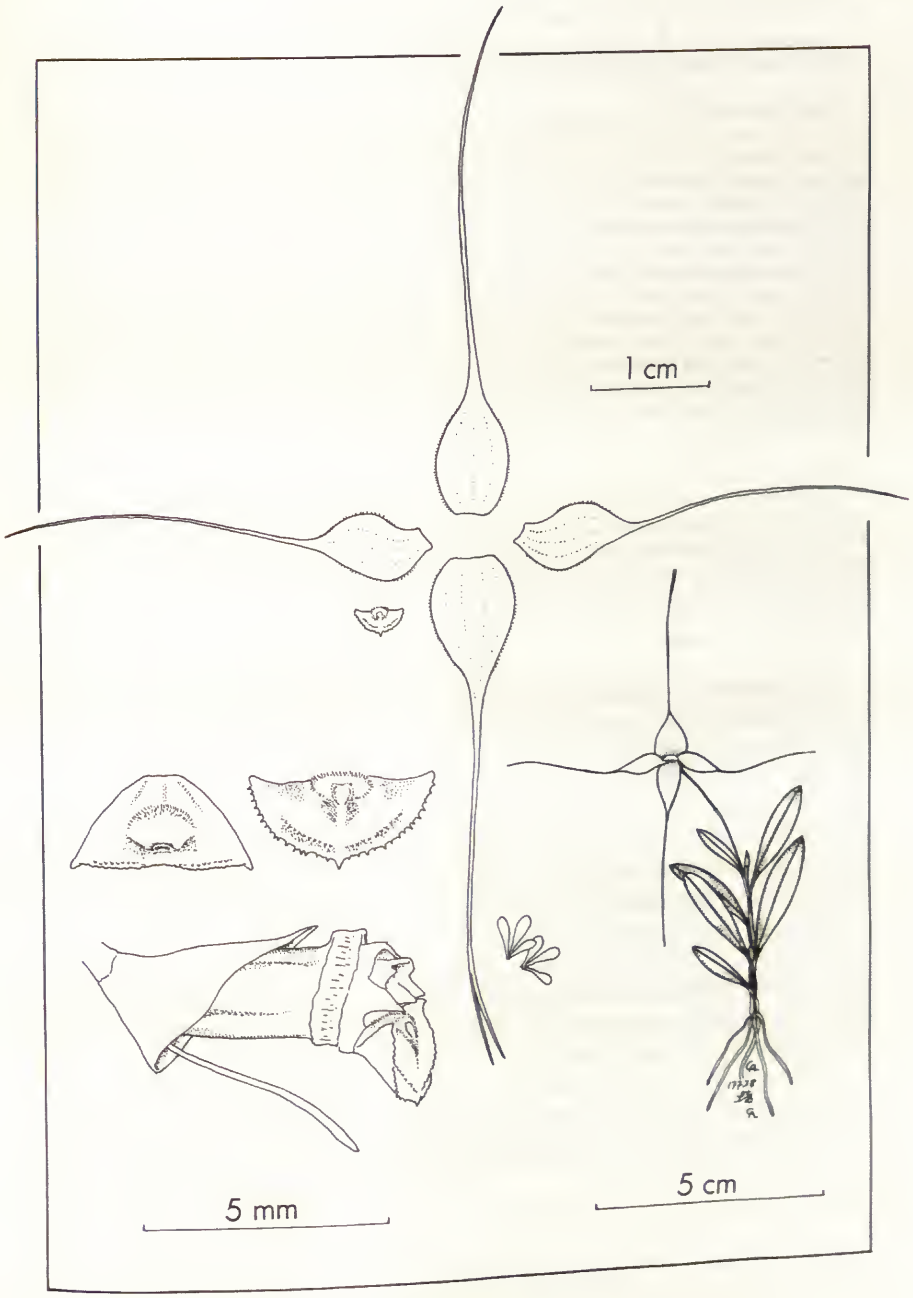


Plate 49. *Brachionidium renzii* Luer

Brachionidium restrepioides (Hoehne) Pabst, Orch. Bras. 166, 1975.

Bas.: *Yolanda restrepioides* Hoehne, Arq. Mus. Nac. Rio de Janeiro 22: 72, 1919.
Ety.: Named for a fancied resemblance to the genus *Restrepia* H.B.K.

Syn.: *Brachionidium dungsii* Pabst, Bradea 1: 268, 1972.
Ety.: Named in honor of its discoverer Dr. F. Dungs.

Plant small to medium in size, epiphytic, the rhizome erect to suberect, branching, stout, 1.5-2 mm thick, up to 10 cm tall, 3-10 mm long between ramicauls, each segment enclosed by 3 imbricating, mucronate sheaths; roots slender, from near the base. Ramicauls suberect, 5-7 mm long, enclosed by 2 mucronate sheaths. **Leaf** suberect, coriaceous, elliptical, acute, apiculate, 12-28 mm long including the petiole 1.5-2 mm long, 6-9 mm wide, 7-veined, the base cuneate into the petiole. **Inflorescence** a solitary, non-resupinate flower borne by an erect, slender peduncle 30-35 mm long, with a loose bract below the middle and at the base, from near the apex of the ramicaul; floral bract infundibular, mucronate, 3 mm long, enclosing the pedicel and ovary; pedicel 0.5 mm long, with a filament 4 mm long; ovary 1.5 mm long; **sepals** yellow, eciliate, the middle sepal ovate, acute, acuminate, 11 mm 5 mm wide, 3-veined, the lateral sepals completely connate into an ovate, obtusely acuminate, concave synsepal, 11 mm long, 7 mm wide, 4-veined; **petals** yellow, eciliate, oblong, oblique, acute, acuminate, 9 mm long 3 mm wide, 3-veined; **lip** transversely ovate, 2 mm long, 3.5 mm wide, the lateral angles acute, lightly incurved, the apex broadly rounded, shortly apiculate, the margins submarginally callous, the disc with a low, flat, ovoid, minutely pubescent callus, bifid on the front surface with a glenion; **column** stout, 1 mm long, bidentate; pollinia 8.

BRAZIL: Estado de São Paulo: Estação Biologica do Alto de Serra São Paulo, Dec. 1920, *F. C. Hoehne 2152* (Holotype:? ; Isotype: MO), C. Luer illustr. 14372; Paranapiacaba, moist forest on escarpment above the Santos Plain, alt. 800 m, 16 Aug. 1968, *R. W. J. Keay K-67* (K). Estado do Rio de Janeiro, near Nova Friburgo, alt. 1300 m, 7 May 1972, *F. Dungs s.n.* (HB, type of *B. dungsii*).

This species is apparently the only representative of the genus in southern Brazil where it was first discovered by Dr. Hoehne. He described it in a new genus, *Yolanda*, because it had eight pollinia. At that time, the number of pollinia in a species of *Brachionidium* had been reported only twice, each species bearing six. Therefore, it was assumed that a *Brachionidium* could have only six pollinia. However, the type-species of the genus, *B. parvifolium*, has been found to have eight pollinia. The accompanying illustration of *B. restrepioides* was made from a dry flower of an isotype reconstituted in concentrated ammonium hydroxide.

The originally published drawing of the lip of *B. restrepioides* is inaccurate. The true appearance of the lip is practically exactly as drawn for the type-description of *B. dungsii*, a purple-colored form discovered in 1972.

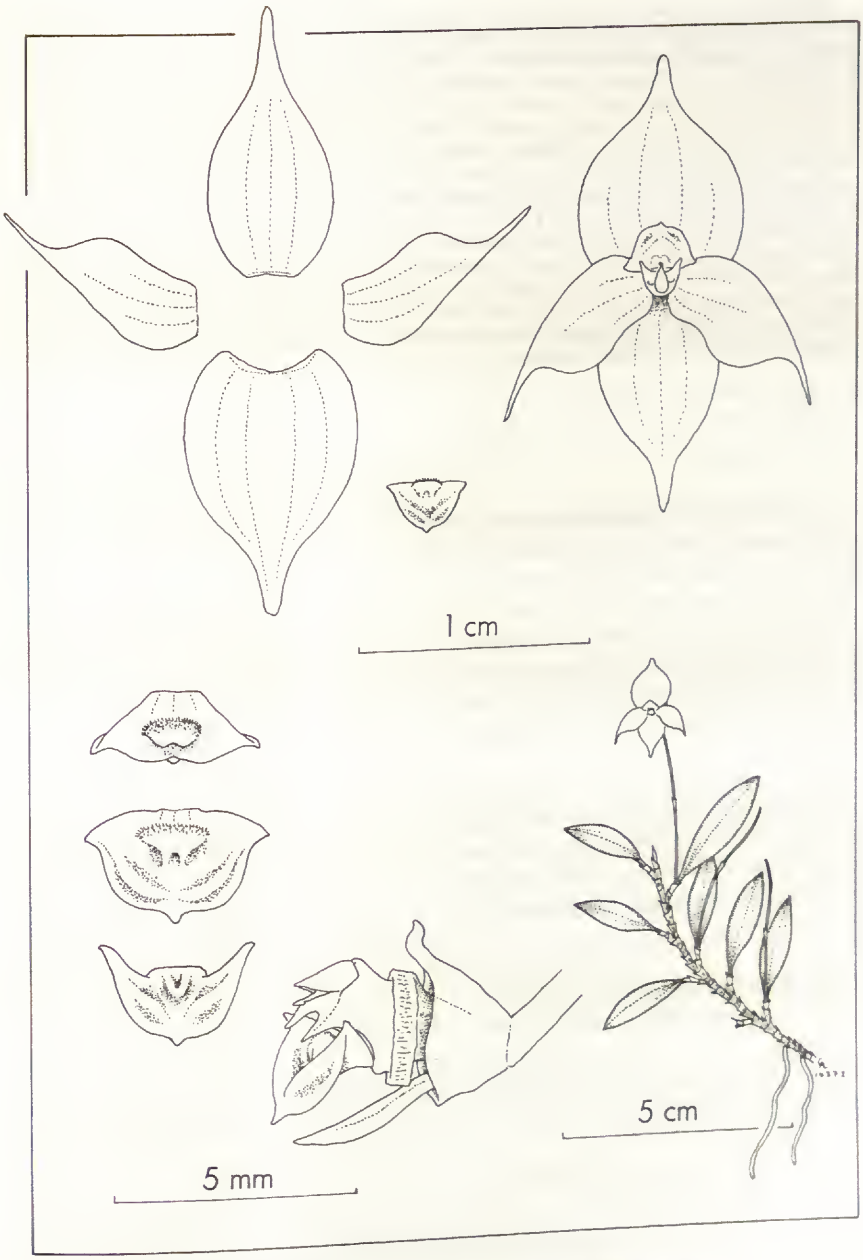


Plate 50. *Brachionidium restrepioides* (Hoehne) Pabst

Brachionidium rugosum Luer, Lindleyana 1: 178, 1986.

Ety.: From the Latin *rugosus*, "with wrinkles," referring to the rugose surface of the leaf.

Plant small to medium in size, epiphytic, the rhizome slender, ascending to erect, up to 20-30 cm tall, occasionally branching, 5-20 mm long between ramicauls, enclosed by 2-3 minutely mucronate sheaths; roots solitary from nodes toward the base. Ramicauls suberect, slender, 3-7 mm long, enclosed by 2 similar sheaths. **Leaf** suberect, thickly coriaceous, purple beneath, dorsally longitudinally rugose-verrucose along the 7 (occasionally 5) veins, the rugae less apparent to absent in some leaves, subdenticulate above the middle, 7-20 mm long including a petiole 1-2 mm long, the blade elliptical, subacute, 4-7 mm wide, the base cuneate into the petiole. **Inflorescence** a solitary, non-resupinate flower, translucent green, veined and suffused with brown, borne by a slender, erect peduncle 7-8 mm long, with a bract near the middle and at the base, from the ramicaul below the apex, floral bract inflated, mucronate, 4 mm long; pedicel 0.5 mm long, with a filament 4 mm long; ovary 2 mm long; **sepals** eciliate, the middle sepal broadly ovate, concave, acute, acuminate, 9 mm long, 5.75 mm wide, 3-veined, the lateral sepals completely connate into a triangular, acute lamina 9.5 mm long, 3.5 mm wide, 2-veined; **petals** eciliate, ovate, oblique, 9 mm long, 3.5 mm wide, 3-veined, the apex acute, acuminate into a short tail; **lip** transversely trapeziform-trilobed, 2 mm long, 3 mm wide, the lateral lobes acute, uncinate, the apex rounded, apiculate, with callous margins, the disc with a flat, shortly pubescent, obscurely bilobed callus; **column** stout, 1 mm long, bidentate; pollinia 6.

ECUADOR: Prov. of Loja: epiphytic in scrubby vegetation in paramo, east of Yangana, alt. 3200 m, 22 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10777* (Holotype: MO).

This species is apparently endemic in southeastern Ecuador at high altitudes over 3000 meters above sea level. It is known only from the original collection. It is characterized by the small, erect rhizome; thickly rugose leaves; glabrous, tailless sepals and petals; and a transverse lip with uncinate lateral angles and a bimarginate margin.

Brachionidium rugosum most closely resembles *B. galeatum* from which it is distinguished by more slender rhizomes without scabrous sheaths, a non-cucullate synsepalum and glabrous sepals and petals.

Brachionidium satyreum Luer, sp. nov.

Ety.: Named for the fancied allusion of the lip and flower to a *satyr*, a mythological woodland deity.

Planta grandis suberecta rhizomate crasso vaginis glabris, foliis ellipticis, 7- vel 9-nervatis, flore atropurpureo, sepalo mediano synsepaloque elliptico-ovatis acuminatis caudatis, petalis similibus oblique reflexis, labello subquadrato-trilobatis, lobis lateralibus erectis acutis, lobo mediano late obtuso, callo oblongo curvato pubescenti.

Plant large, epiphytic or terrestrial in loose moss, erect to suberect, up to 25 cm tall, the rhizome relatively stout, occasionally branching, 15-20 mm long between ramicauls, enclosed by 2-3 tubular, mucronate sheaths; roots coarse from near the base. Ramicauls slender, suberect, 6-7 mm long, enclosed by 2 tubular, mucronate sheaths. **Leaf** erect or suberect, coriaceous, elliptical, acute to subacute, 15-24 mm long including a petiole 2-3 mm long, 6-11 mm wide, 7- to 9-veined. **Inflorescence** a solitary, non-resupinate flower borne by a slender, erect peduncle 20-26 mm long, with a bract near the middle, from near the apex of the ramicaul; floral bract inflated, acute, mucronate, 4 mm long, enclosing the pedicel and part of the ovary; pedicel 1 mm long, with a filament 5 mm long; ovary 3 mm long; **sepals** dark wine purple, the middle sepal elliptical, convex with revolute sides, acute, acuminate, the blade 12 mm long, 6

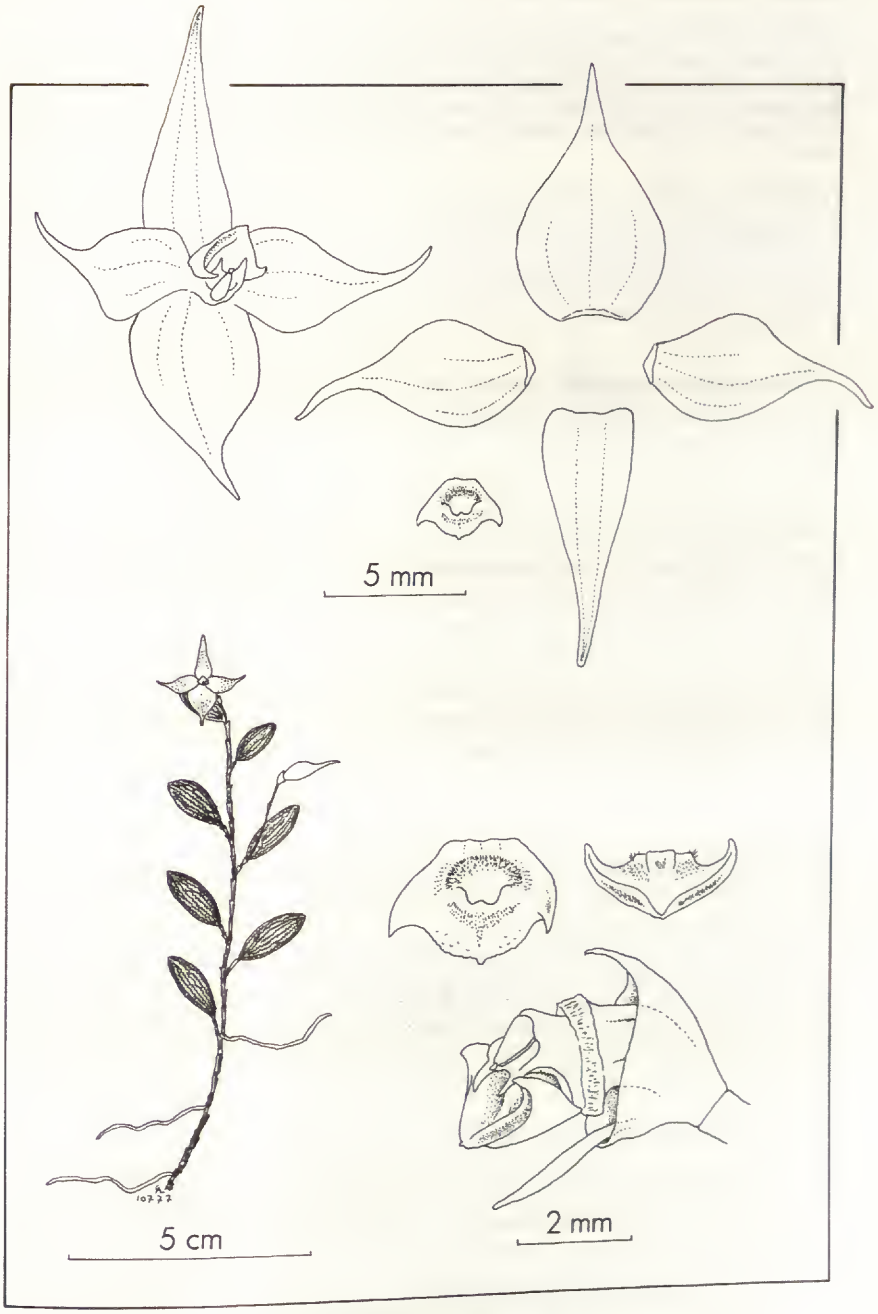


Plate 51. *Brachionidium rugosum* Luer & Hirtz

mm wide, 3-veined, the tail filiform, 13 cm long; lateral sepals connate into an ovate, acute, acuminate, synsepal, concave with the middle third convex, the blade 11 mm long, 6.5 mm wide expanded, 4-veined, the tail filiform, 14 mm long, the tips free for 2 mm; **petals** deep wine red, reflexed, minutely ciliate, ovate, oblique, acute, acuminate, the blade 8 mm long, 5 mm wide, 3-veined, the tail 5 mm long; **lip** purple, subquadrate-trilobed, acutely deflexed near the middle, 1.5 mm long, 2.5 mm wide, the lateral angles subacute, erect, the middle lobe broadly obtuse, concave centrally below the callus, the disc with a rounded, curved, pubescent callus, protruding above the cavity of the blade; **column** stout, 1 mm long, pollinia 6.

PANAMA: Prov. of Bocas del Toro: Trocha 3 de noviembre, near Paso de la Zorra over the continental divide, alt. 1500 m, 5 Apr. 1977, *R. L. Dressler, K. Dressler & N. H. Williams 5809* (Holotype: MO), C. Luer illustr. 14560; ?Cerro Colorado, 50 Km north of San Félix, alt. 1400, 20 Sept. 1977, *R. L. Dressler 5712* (MO).

This species is apparently endemic in wet, cloud forests along the continental divide in western Panama where it was first discovered and photographed by Robert Dressler and companions. It is identified by the large, more or less erect habit; elliptical leaves; glossy, dark purple flowers; elliptical-ovate sepals with equally long tails; acutely reflexed, minutely ciliate, short-tailed petals; and a small, subquadrate lip with erect, acute, lateral lobes. The rounded, pubescent callus projects forward from the deflexed base.

Brachionidium serratum Schltr., Repert. Spec. Nov. Regni Veg. 9: 164, 1911.

Ety.: From the Latin *serratus*, "serrate," referring to the petals.

Plant small, presumably epiphytic, the rhizomes slender, repent. Ramicauls slender, 5 mm long. **Leaf** erect, coriaceous, elliptical, 7-16 mm long, 3-4 mm wide. **Inflorescence** a solitary flower borne by an erect, slender peduncle, floral bract broadly ovate, shortly acuminate; ovary 3 mm long; **sepals** purple, glabrous, carinate, the middle sepal ovate-lanceolate, apiculate, 8 mm long, 4 mm wide below the middle, the lateral sepals completely connate into an ovate, rather obtuse lamina, 8.5 mm long, 5 mm wide below the middle; **petals** lanceolate, oblique, acuminate, densely serrate, 8 mm long; **lip** broadly rhomboid, quadrate, unguiculate, shortly apiculate, lateral angles obtuse, with a central, rounded callus, 3.5 mm long, 3.5 mm wide; **column** short, bidentate; pollinia 6.

"PERU: Bei Cochobamba," 1907, *Dr. Filomeno s.n.* (Holotype destroyed at B).

This small species, collected from an unknown locality by an obscure collector, is known only from the type-description. The holotype was destroyed at Berlin, and no subsequent collection is known to have been made. The above description was made from Schlechter's original publication.

Apparently *B. serratum* is a small, repent species with ovate leaves about 15 millimeters long. The flower is very small and purple without sepaline tails, the ovate sepals being only eight millimeters long. The equally long petals are described as "scharf gesägten" (sharply saw-toothed). The lip, described as thickly rhomboid and obtuse, apparently is similar to forms commonly seen.

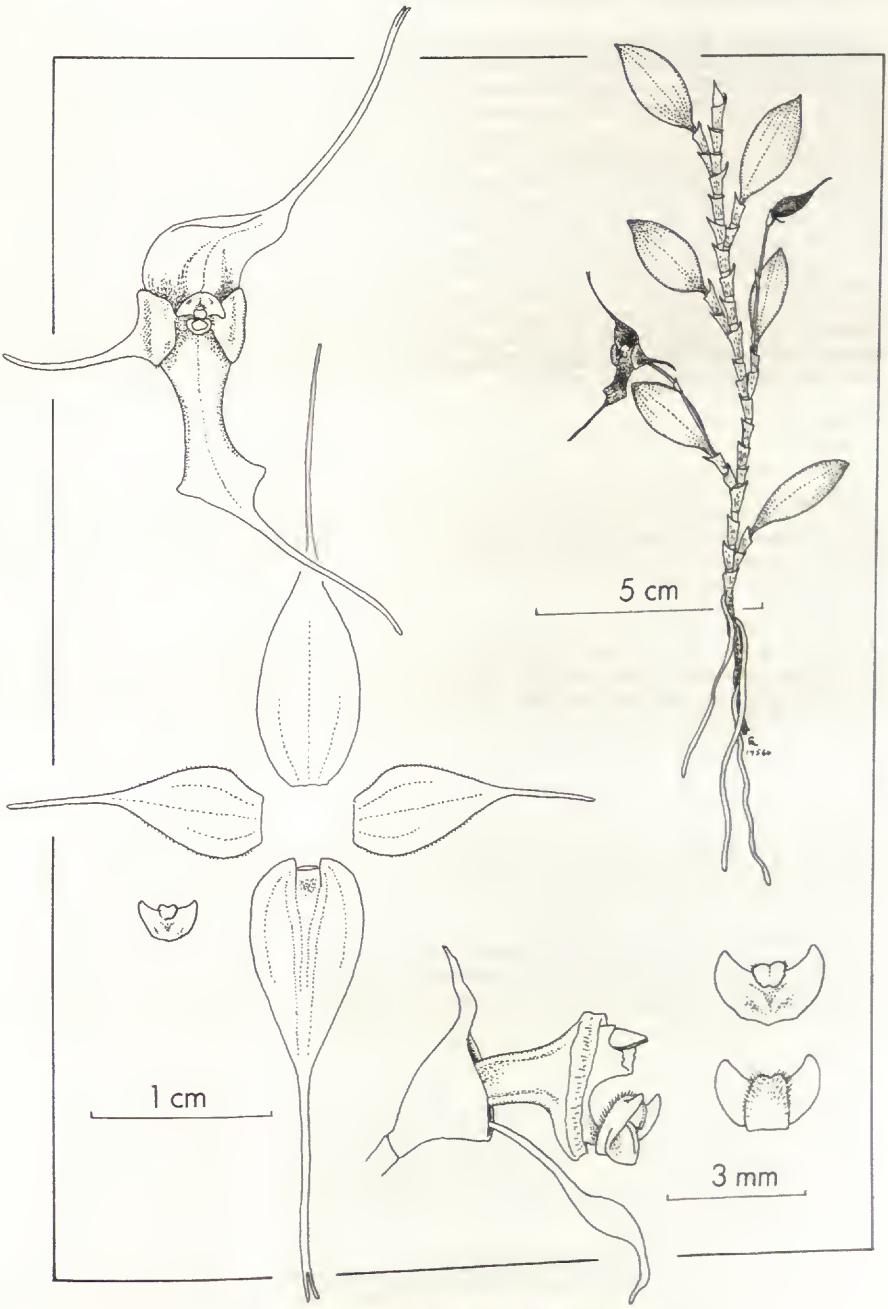


Plate 52. *Brachionidium satyreum* Luer

Brachionidium sherringii Rolfe, Bull. Misc. Inform. 4, 1893.

Ety.: Named in honor of R. V. Sherring, who collected the plant in 1890.

Plant medium in size, epiphytic, the rhizome slender to stout, long-repent to ascending or erect, up to 25 cm long, occasionally branching, 5-17 mm long between ramicauls, enclosed by 2-3 mucronate sheaths; roots solitary from nodes along the rhizome. Ramicauls suberect, slender, 5-10 mm long, enclosed by 2 similar sheaths. **Leaf** suberect, coriaceous, 15-35 mm long including a petiole 2-3 mm long, the blade elliptical, acute, 5-14 mm wide, 7-veined, the base cuneate. **Inflorescence** a solitary, non-resupinate flower, translucent white or yellow to dark purple, borne by a slender, erect peduncle 3-5 cm long, with a bract near the middle, from the ramicaul near the apex; floral bract inflated, long-mucronate, 3 mm long, enclosing the pedicel and ovary; pedicel 0.6 mm long, with a filament 4 mm long; ovary 2 mm long; **sepals** ciliate, the middle sepal elliptical, the blade 7-8 mm long, 4-5 mm wide, 3-veined, the apex acute, acuminate into a filiform tail 8-11 mm long, the lateral sepals connate into a similar, concave, elliptical lamina 7-8 mm long, 4.5-5.5 mm wide, 4-veined, the apex acute, acuminate into a filiform tail 9-11 mm long, bifid at the apex; **petals** minutely ciliate, ovate, oblique, 6-7 mm long, 2.5-3.5 mm wide, 3-veined, the apex acute, acuminate into a tail 8-11 mm long; **lip** transversely trapeziform-triangular, 1.5 mm long, 2 mm wide, the lateral angles obtuse to minutely uncinate, the apex obtuse, apiculate, with longitudinally callous margins, the disc with an ovoid, shortly pubescent callus; **column** stout, 1 mm long and broad, bidentate; pollinia 6.

GRENADA: Top of Fedon's Camp, alt. 2400 ft., Oct.-May 1890-1891, *R. V. Sherring, s.n.* (Holotype: K; Isotype: AMES), C. Luer illustr. 14458; Top of Fedon's Camp, 23 June 1896, *W. E. Broadway s.n.* (AMES, NY, US); Mount St. Catherine, alt. 2000-3000 ft., 3 Mar. 1896, *L. Jones-Bateman s.n.* (K); Mount St. Catherine, 19 Oct. 1945, *Pamela Beard 1310* (AMES, F, K, MO, S, US).
GUADELOUPE: Matouba, Trois Rivieres, 1892, *P. Duss 3345* (AMES, NY, US); Chemin du Matelyane a la Savane aux Ananas, 12 June 1898, *P. Duss 3971* (NY); Savane aux Ananas, 1898, *P. Duss 3980* (BR, NY); Matelyane, Lac Flammarion, alt. 1100 m, 25 Apr. 1936, *H. Stehlé 470* (NY, VEN); Savane aux Ananas, 28 Apr. 1936, *H. Stehlé 429* (NY); Savane aux Ananas, alt. 1100 m, 7 Feb. 1937, *H. Stehlé 1370* (NY); Riviere Saint-Louis, alt. 890 m, 22 Feb. 1936, *H. Stehlé 398* (NY); Basse-Terre, Massif de la Soufrière, alt. 1000 m, 5 May 1974, *C. Sastre & F. Sastre 2873* (GUAD, MO); Riviére Carbet, alt. 1200 m, 9 Feb. 1937 *H. Stehlé 1368* (NY); Citeme, Lac Flammarion, alt. 1100 m, 8 Feb. 1937, *H. Stehlé 1369* (NY); Chemin de la Citerne, Sphagnicole, alt. 1150 m, 8 Feb. 1937, *H. Stehlé 1371* (AMES, NY); Riviére Carbet frés des Sources, derriviére la Soufriére, alt. 1200 m, 9 Feb. 1937, *H. Stehlé 1372*; Chemin de la Citerne, alt. 1120 m, 27 June 1937, *H. Stehlé 1681* (NY); Ravine Longueteau, alt. 1200 m, 27 July 1937, *H. Stehlé 2029* (US); Trace du Lac Flammarion, alt. 1100 m, 2 Nov. 1937, *H. Stehlé 2470* (NY); Ravine Longueteau, alt. 1080 m, 25 July 1937, *H. Stehlé 2581* (NY); Entre l'Ajoupa de la Riviere Rouge et le Haut-Matouba, 3 Apr. 1974, *J. Fournet 1882* (GUAD). Probably: near summit of la Soufrière, alt. 1480 m, 15 Jan. 1894 *P. Duss 3730* (NY). Without collection data, *M. L'Herminier s.n.* (G, MO).
DOMINICA: Mt. Diablotin, 1903, *F. E. Lloyd 908* (AMES, NY); Morne Trois Piton, alt. 763-1400 m, 15 Aug. 1938, *W. Hodge 389* (NY); same area, 23 Feb. 1940, *W. Hodge 1382* (AMES, NY); Morne Anglais, 21 Mar. 1940, *W. Hodge 2294* (AMES); Morne Trois Pitons, alt. 2500-3500 ft., 4 May 1964, *W. R. Ernst 1226, 1226A* (US); 8 Aug. 1965, *W. R. Ernst 2028* (US); Morne Trois Piton, alt. 4000-4400 ft., 29 July 1964, *R. L. Wilbur, E. Dunn, H. Hespenheide & D. Wiseman 8077, 8098* (AMES, F, MO, US); Morne Trois Pitons, alt. ca. 3800 ft., 21 Feb. 1966, *K. L. Chambers 2757* (US).
MARTINIQUE: Pitons du Carbet, alt. 1200 m, 5 Sept. 1937, *H. Stehlé 2503* (NY); without locality, *P. Duss 380* (C); Mt. Pelée, Sept. 1901, *P. Duss 4686* (NY); Mt. Peleé, May 1854, *Belanger 766* (W); without locality, *Belanger 122* (G).
ST. KITT'S: forest slopes of Mt. Misery, *N. L. Britton & J. F. Cowell 524* (NY, US).
ST. LUCIA: near summit of Morne Gimie, alt. 3100 ft., 15 Mar. 1971, *R. A. Howard & R. E. Weaver 17923* (AMES).
ST. VINCENT: Cumberland Valley, leeward, alt. 1000 m, Sept. 1890, *N. U. Smith & G. Smith 1142* (K).
DOMINICAN REPUBLIC: Constanza, El Convento, Loma Priete, alt. 1300 m, 2 Feb. 1974, *D. Dod & A. Liogier 635* (JBSD), specimen sterile. CUBA: ?

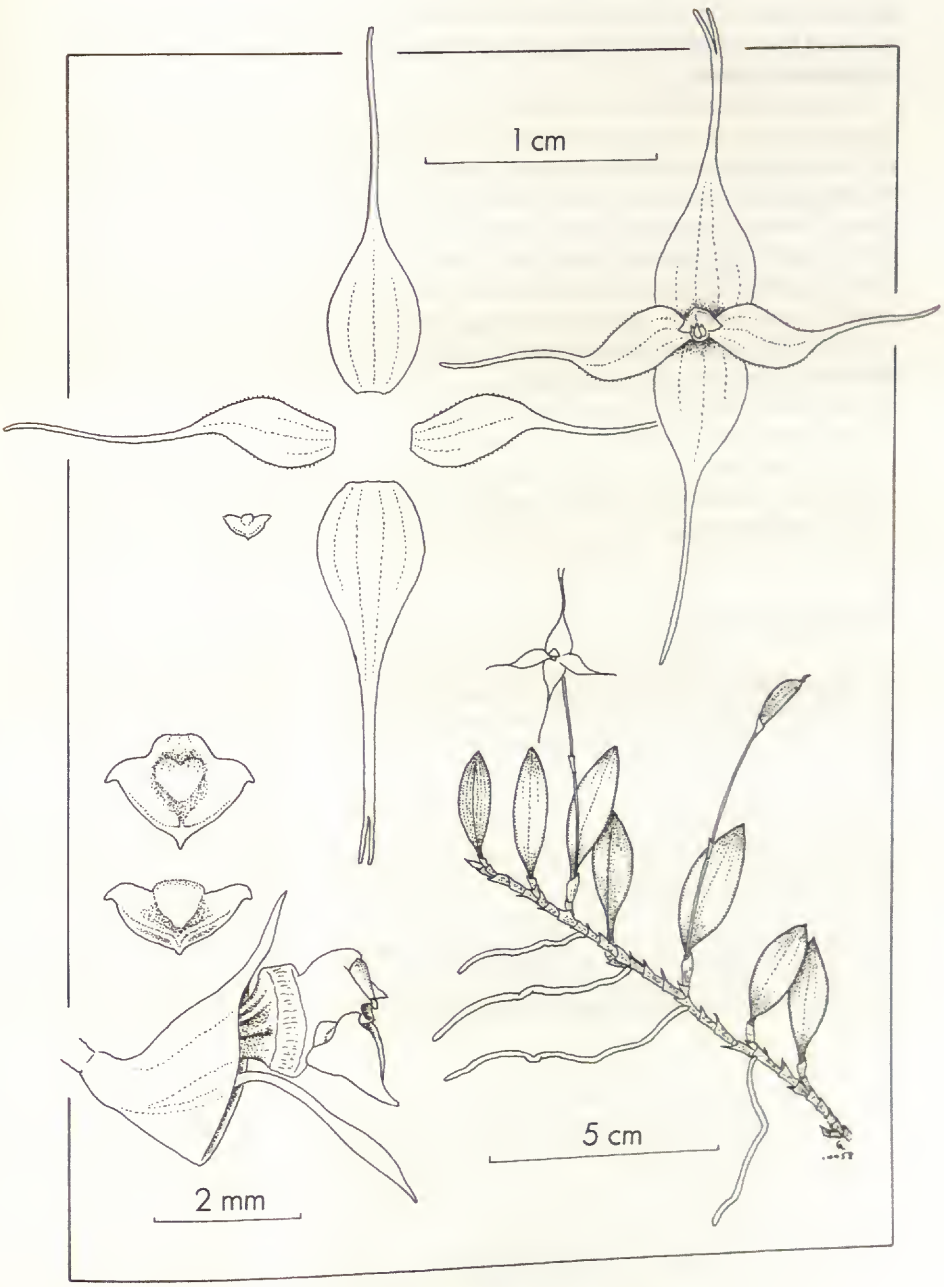


Plate 53. *Brachionidium sherringii* Rolfe

This species, frequent and widely distributed near the tops of the mountains of the islands in the Lesser Antilles, was first collected on Grenada in 1890 by R. V. Sherring for the West India Exploration Committee. The accompanying illustration was made from a dried flower from the type-collection reconstituted in concentrated ammonium hydroxide.

Brachionidium sherringii is variable in size vegetatively, ranging from small to relatively large. The habit is commonly long-repent, but more or less erect forms are not infrequent, presumably depending upon the amount of exposure and light. The long-tailed flowers vary in size from relatively small to medium in size for the genus. The color varies from yellow-green to dark red-purple. The sepals are not ciliate, but the petals are microscopically ciliate. The transverse lip with a central callus is basically similar to the lips of many other species: transversely subovate, broadly obtuse, minutely apiculate, with longitudinally callous margins, and with an ovoid, shortly pubescent, central callus. The tips of the lateral angles of the lip are minutely uncinate in the type-collection, as well as in others, but these angles are simply obtuse on the lips of some other collections.

Small forms grade into *B. parvum*. Although the sepals of the larger *B. sherringii* are eciliate, and the sepals of the small *P. parvum* are minutely ciliate, exceptions occur. The two taxa could be considered merely vegetative and floral forms of one variable species.

Brachionidium simplex Garay, Canad. J. Bot. 34: 741, 1956.

Ety.: From the Latin *simplex*, "simple," referring to the entire lip and sepals.

Plant medium in size, terrestrial, suberect to erect, up to 15 cm tall, the rhizomes relatively stout, occasionally branching, 5-8 mm long between ramicauls, with 3 loose, long-mucronate sheaths; roots at the base, more or less coarse. Ramicauls suberect, slender, 2-4 mm long, enclosed by 2 tubular, mucronate sheaths. **Leaf** erect to suberect, thickly coriaceous, elliptical, acute, minutely apiculate, 15-20 mm long, 5-7 mm wide, 7- (occasionally 5-) veined, the base cuneate into a petiole 2-3 mm long. **Inflorescence** a solitary, light yellow-green, non-resupinate flower borne by an erect, capillary peduncle 12-20 mm long, with an mucronate bract near the middle an above the base; floral bract, 2 mm long, mucronate, enclosing pedicel and much of the ovary; pedicels thick, 1 mm long, with a protruding filament 3.5 mm long; ovary 2 mm long; **sepals** membranous, translucent, microscopically sparsely ciliate, the middle sepal elliptical, obtuse, shortly acuminate, 11 mm long, 6.5 mm wide, 3-veined, the lateral sepals completely connate into a broad, ovate synsepal, 11 mm long, 8 mm wide, 4-veined, the apex obtuse, minutely bifid; **petals** minutely ciliate, ovate, oblique, acute, acuminate, 10 mm long, 4 mm wide, 3-veined; **lip** transversely obovate, 2.5 mm long, 4 mm wide, with obtuse lateral angles, the apex transverse, shortly and obtusely apiculate, the disc transversely thickened, with a central, triangular, flattened, pubescent callus, the broad base hinged to the column-foot; **column** stout, 1 mm long, bidentate; pollinia 6.

ECUADOR: Without locality, "Quito," *W. Jameson s.n.* (Holotype: AMES). Prov. of Morona-Santiago: terrestrial in cloud forest east of Gualaceo, alt. 2150 m, 14 Jan 1989, *C. Luer, J. Luer, P. Jesup, A. Jesup, A. Hirtz & S. Ortega 13894* (MO).

The type-specimen of *Brachionidium simplex* was collected in the nineteenth century by Professor Jameson who lived in Quito, Ecuador. No collection data are known, and how the specimen arrived in the personal herbarium of Garay is also unknown. The original description was drawn from a reconstituted, dried flower,

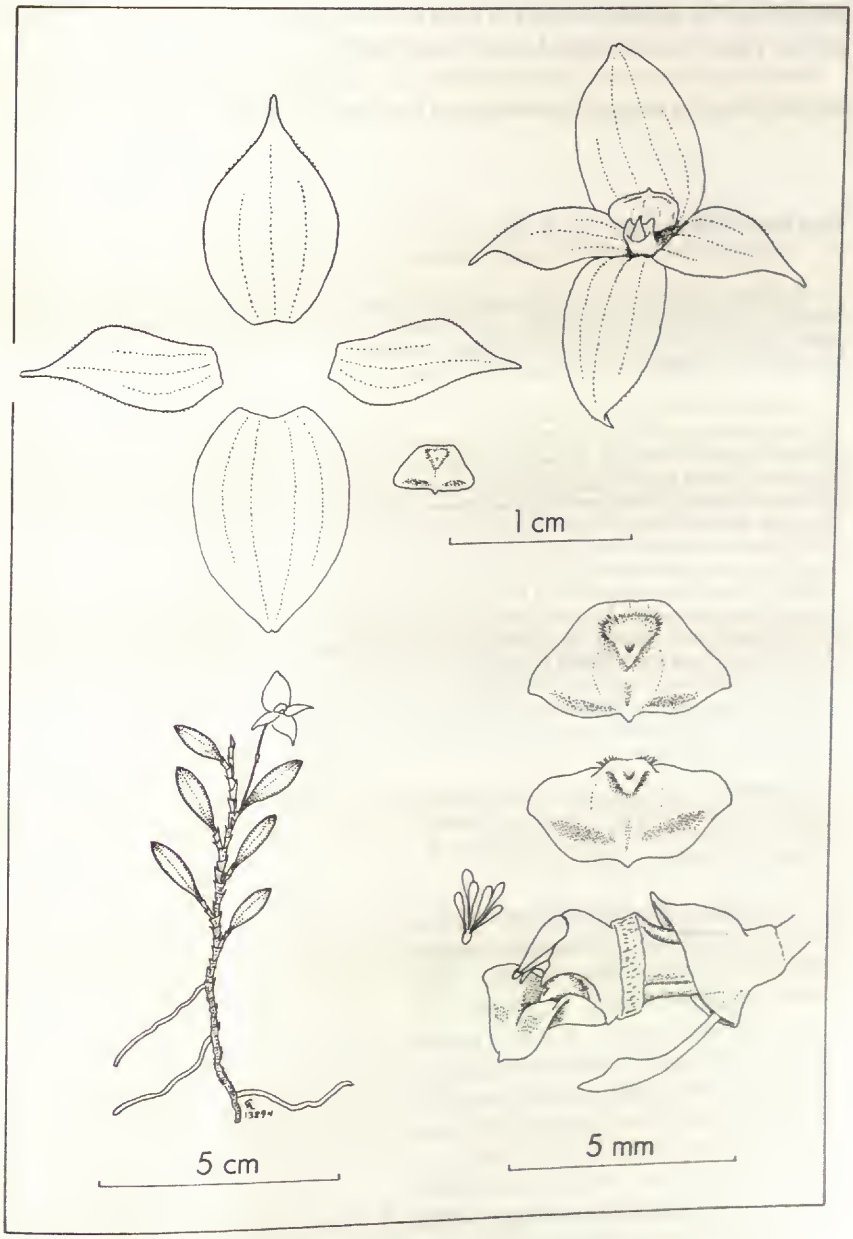


Plate 54. *Brachionidium simplex* Garay

so discrepancies between it and the present description drawn from freshly pickled material are to be expected. The flower of the recent collection is a little larger than that of Jameson, but the drawing of the plant and floral parts including the lip agree except for an additional pair of veins shown in the synsepal. Six pollinia are present. These were not reported in the type-description.

Brachionidium simplex is most similar to *B. pteroglossum* and *B. tetrapetalum*, but from them it is most easily identified by the obtuse, tailless synsepal.

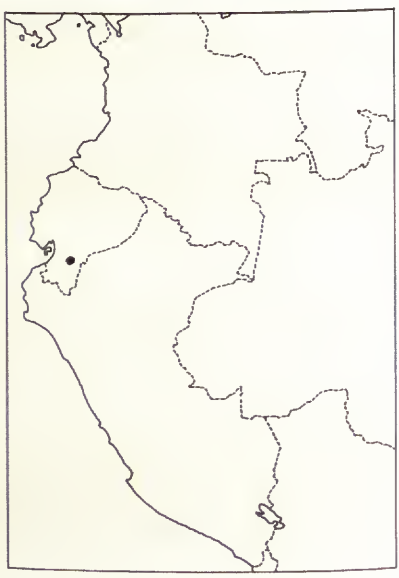
Brachionidium stellare Luer & Hirtz, sp. nov.

Ety.: From the Latin *stellaris*, "like a star," referring to the four-pointed flower.

Planta parva suberecta vel erecta, rhizomate gracili elongato, pedunculo gracili folio elliptico leviter longiore, sepalis purpureis minute ciliatis, sepalo impari elliptico acuto longissime caudato, synsepalo simili, petalis ellipticis acutis minute ciliatis longi-acuminatis, labello transverse ovato, angulis lateralibus acutis, apice rotundato, marginibus ambabus profunde concavis.

Plant small, terrestrial, erect to suberect, the rhizomes slender, occasionally branching, 3-12 mm long between ramicauls, with 3 loose, long-mucronate sheaths; roots slender at the base. Ramicauls suberect, slender, 4-5 mm long, enclosed by 2 tubular sheaths. **Leaf** erect to suberect, coriaceous, elliptical, acute, 7-12 mm long, 2-4 mm wide, 7-veined, the base contracted into a petiole 2-3 mm long. **Inflorescence a solitary, purple, non-resupinate flower borne by an erect, capillary peduncle 15-20 mm** long, with an mucronate bract near the middle and at the base; floral bract 3 mm long, long-mucronate, enclosing the pedicel and ovary; pedicels thick, 0.5 mm long, with a protruding filament 3 mm long; ovary 2 mm long; **sepals** microscopically ciliate, the middle sepal elliptical, acute, acuminate, long-caudate, 14 mm long including the tail 7 mm long, 4 mm wide, 3-veined, the lateral sepals completely connate into a synsepal similar to the middle sepal, 13 mm long, 5 mm wide, 4-veined, the acute apex long-acuminate into a capillary tail; **petals** minutely ciliate, elliptical, lightly oblique, acute, acuminate, long-caudate, 13 mm long including the capillary tail 7 mm long, 3.5 mm wide, 3-veined; **lip** transversely ovate, 1.5 mm long, 2 mm wide, with acute, incurved lateral angles, the apex rounded, with crescent-shaped areas on both sides within the margins deeply concave, the disc with a central, elevated, flattened, ovoid, microscopically pubescent callus, the broad base hinged to the column-foot; **column** stout, 1 mm long, bidentate; pollinia 6.

ECUADOR: Prov. of Morona-Santiago: terrestrial in cloud forest east of Gualaceo, alt. 2150 m, 16 May 1988, *C. Luer, A. Hirtz, W. Flores, A. Andreetta & W. Teague* 13397 *(Holotype: MO)*.



This small species is known from a single collection in southeastern Ecuador where it is presumably endemic. It is characterized by a small, erect habit with small, elliptical leaves. It bears a purple flower comparatively large for the size of the plant. The minutely ciliate sepals and petals are acuminate with slender tails about as long as the blades. The lip is transversely ovate with proportionately large, crescent-shaped concavities within each side of the bimarginate lip. Of the six pollinia attached to a single viscidium, two of the pollinia are half the size of the others.

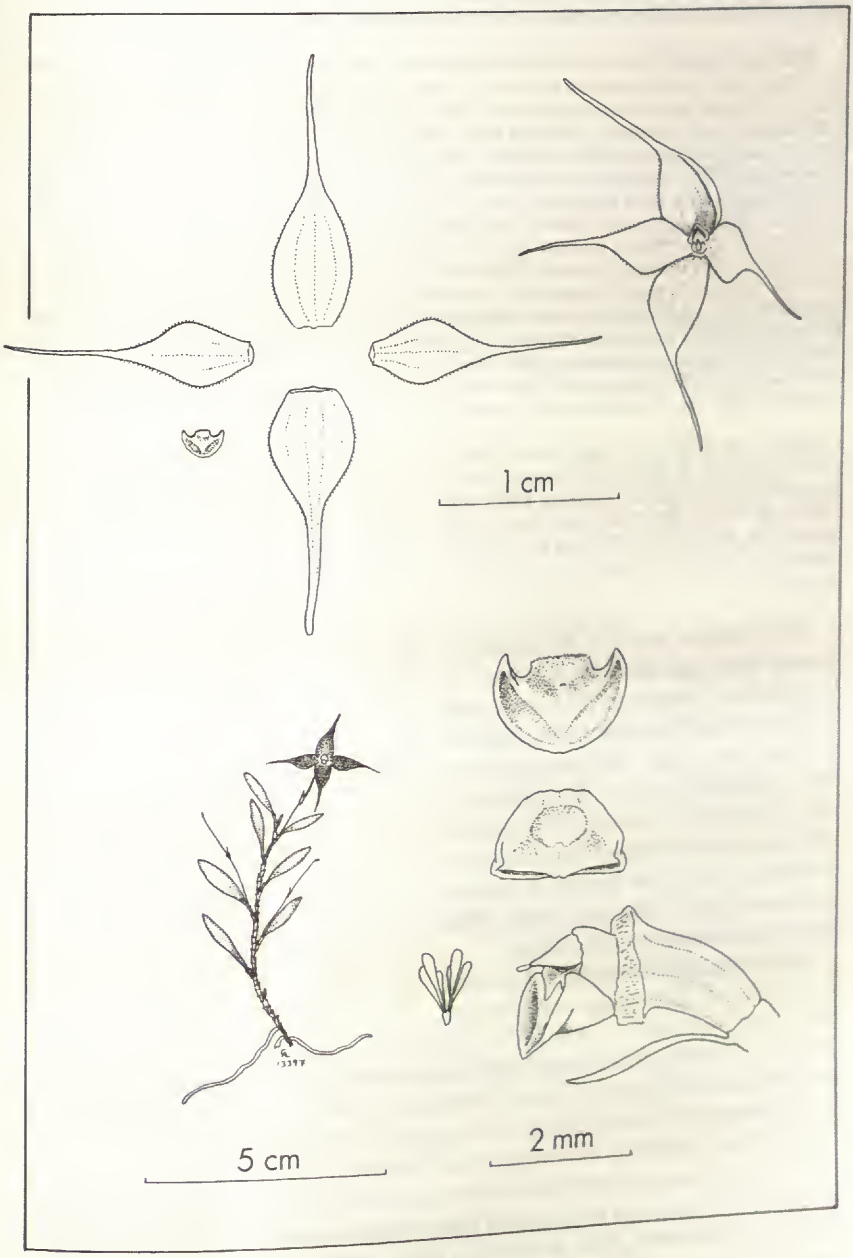


Plate 55. *Brachionidium stellare* Luer & Hirtz

Brachionidium syme-morrisii Luer, sp. nov.

Ety.: Named in honor of George Syme and Sir Daniel Morris, who first collected the species.

Planta parva erecta vel suberecta, sepalis petalisque longicaudatis, labello transverse ovoideo supra fisso, apice manifeste acuminato, angulis lateralibus longicomutis et marginibus latis concavis.

Plant small, epiphytic, the rhizome slender, ascending to erect, up to 5 cm tall, occasionally branching, 3-5 mm long between ramicauls, enclosed by 2 mucronate sheaths; roots subfasciculate near the base of the rhizome. Ramicauls suberect to erect, slender, 7-10 mm long, enclosed by 2 similar sheaths. **Leaf** suberect to erect, coriaceous, 13-20 mm long including a petiole 2-3 mm long, the blade elliptical, acute, 5-8 mm wide, 7-veined, the base cuneate. **Inflorescence** a solitary, non-resupinate flower, translucent purplish, borne by a slender, erect peduncle 2-3 cm long, with a bract near the middle, from the ramicaul near the apex; floral bract inflated, long-mucronate, 3.5 mm long, enclosing the pedicel and ovary; pedicel 1 mm long, with a filament 5 mm long; ovary 3.5 mm long; **sepals** microscopically ciliate, the middle sepal elliptical, the blade 10 mm long, 5 mm wide, 3-veined, the apex acute, acuminate into a filiform tail 16 mm long, the lateral sepals connate into a concave, elliptical lamina 10 mm long, 8 mm wide expanded, 4-veined, the apex acute, acuminate into a filiform tail 15 mm long, bifid at the apex; **petals** microscopically ciliate, ovate, markedly oblique, 10 mm long, 4.5 mm wide, 3-veined, the apex acute, acuminate into a tail 13 mm long; **lip** transversely trapeziform-triangular, 1 mm long, 2 mm wide, the lateral angles long-uncinate to either side of the column, with broad, callous, concave margins, acutely angled medially, the apex acute, shortly acuminate, the disc subrectangular, cleft medially, with a transversely lunate, shortly pubescent callus; **column** stout, 1 mm long and broad, bidentate; pollinia 6.

JAMAICA: Mt. Moses, alt. 3000-5000 ft., Nov. 1881, *G. Syme & D. Morris 2361* (Holotype:K, Isotype: W), C. Luer illustr. 14459; Mt. Moses, alt. 1000 m, *W. Harris 7802* (Herb. Bot. Dept.); Mt. Moses, 1908, received from *W. Harris s.n.* (NY); St. Andrew, Mt. Horeb, Port Royal Mts. *G. R. Proctor 6847* (J).

This species was first collected by George Syme and Sir Daniel Morris on Mt. Moses in Jamaica in 1881, and again in 1882. An excellent pencil drawing made by Syme on 20 Sept. 1882 is appended to the type-specimen at Kew. Reichenbach's sketch present in his herbarium at W (Vienna) has the intended name *Brachionidium morrisii*. This species is endemic in Jamaica, and it is the only species of the genus known to occur on the island.

In his original description of *B. parvum* Cogniaux cites four separate collections as the "type," one being a collection of this species by Harris from Mt. Moses in Jamaica. Probably this is because the habit of the Jamaican species is smaller in size than the usually long-repent *B. sherringii*. One of the two specimens cited from Grenada has been chosen as the lectotype of *B. parvum*.

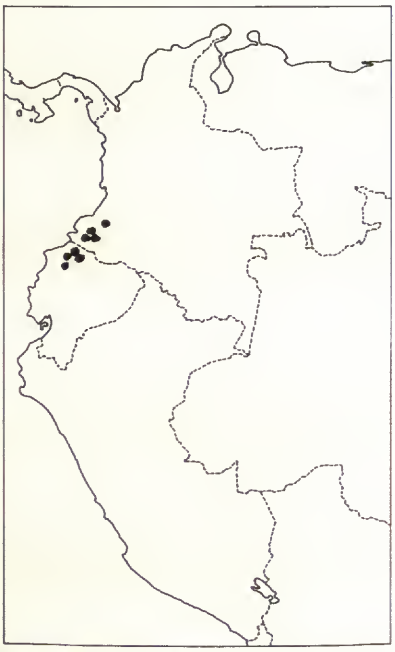
In 1910, Cogniaux in the *Orchidaceae Antillanae* and Fawcett and Rendle in the *Orchids of Jamaica* published the Syme and Morris' collection as *B. sherringii*. Every author since then has followed them. *Brachionidium syme-morrisii* is distinguished by the small, more or less erect habit; minutely ciliate sepals and petals; and a distinctive, cleft lip with erect, hornlike lateral lobes with broad, concave margins.

Plate 56. *Brachionidium syme-morrisii* Luer

Brachionidium tetrapetalum (Lehm. & Krzl.) Schltr., Repert. Spec. Nov. Regni Veg. Beih. 7: 241, 1920.

Bas.: *Pleurothallis tetrapetala* Lehm. & Krzl., Bot. Jahrb. Syst. 26: 446, 1899.
Ety.: From the Greek *tetrapetalos*, "with four petals," referring to the appearance of the flower.

Plant small, terrestrial, the rhizome erect, branching, up to 20 cm tall, 5-10 mm long between ramicauls, each segment with 3 pale, glabrous, loosely fitting, mucronate sheaths; roots slender, produced mostly near the base. Ramicauls 3-5 mm long, suberect, enclosed by 2 similar sheaths. **Leaf** suberect, coriaceous, elliptical, acute, apiculate, 8-14 mm long including the petiole 0.5 mm long, 4-8 mm wide, 7-veined, the base cuneate into the petiole. **Inflorescence** a single, bright purple. non-resupinate flower borne by a slender peduncle 8-15 mm long, with an inflated bract near the middle and another at the base, from near the apex of the ramicaul; floral bract infundibular, oblique, 3-4 mm long, enclosing the pedicel and ovary; pedicel thick, 0.5-1 mm long, with a protruding filament 3.5 mm long; ovary 2.5 mm long; **sepals** shortly ciliate, the middle sepal ovate, 6-8 mm long, 3.75-5 mm wide, 3-veined, the acute apex shortly acuminate, the lateral sepals completely connate into an ovate lamina similar to the middle sepal, 6-8 mm long, 3.75-4.75 mm wide, 4-veined; **petals** shortly ciliate, ovate, 5.5-7.5 mm long, 2.75-3.5 mm wide, 3-veined, the apex acute, oblique, acuminate; **lip** thick, transversely ovate, 2.5-3 long, 3 mm wide, the lateral angles obtuse, the apex rounded, apiculate, the margins longitudinally callous, the disc with a central, rounded minutely pubescent callus, lightly bifid anteriorly as a glenion; **column** stout, 2 mm long; pollinia 8.



COLOMBIA: Dept. of Nariño: mossy marsh east of Pasto, Bordoncillo, alt. 3300 m, 20 Feb. 1881, *F. C. Lehmann 347* (Holotype: K; Isotypes: AMES, BR, W); Páramo Cumbal, *H. Karsten s.n.* (W); Volcán Galeras, alt. 3200 m, 21 Jan. 1979, *C. Luer & J. Luer 3737* (SEL); Munic. de Túquerres, Volcán Azufral, alt. 3200-3400 m, 10 Feb. 1962, *L. E. Mora 1872* (US). Dept. of Cauca: above Popayán, Paramo de Guanacas, alt. 3500-3800 m, *F. C. Lehmann 6912* (K); Cabeceras del Río Palo, Quebrada del Duende, alt. 3400 m, 3 Dec. 1944, *J. Cuatrecasas 18947* (AMES). Volcán Puracé, Páramo de San Rafael, alt. ca. 10,000 ft., 23 July 1960, *L. A. Garay 18* (AMES). ECUADOR: Prov. of Carchi: 30 Km west of Tulcán, near Voladero, alt. 3500 m, 23 Nov. 1974, *G. Harling & L. Andersson 12100* (AMES, GB); paramo near El Angel, alt. 3750 m, July 1983, *A. Hirtz 1059* (MO); same area, alt. 3850 m, 14 Mar. 1985, *B. Eriksen 59073* (AAU); terrestrial in paramo between El Angel and Tulcán, alt. 3650 m, 5 April 1985, *C. Luer, J. Luer, A. Hirtz & X. Hirtz 11066* (MO); near El Playón, alt. 3300-3600 m, 29 Dec. 1980, *L. Holm-Nielsen, J. Jaramillo & F. Coello 29940* (AAU); Laguna Verde, south slopes of Volcán Chiles, alt. 3900-4000 m, 19 Jan. 1988, *U. Molar, B. Eriksen & M. Fredrikson 2577* (AAU, GB); El Mirador east of Tulcán, alt. 3400 m, *A. Hirtz et al. 5565* (MO). Prov. of Imbabura: above Selva Alegre, alt. 10,800 ft., 25 Apr. 1944, *W. Drew E-147* (AMES); east slope of Volcán Cayambe, alt. 9,700-10,000 ft., 21 July 1944, *W. B. Drew E-361* (AMES).

This small, erect-growing species grows with *Lepanthes aberrans* Schltr. in the cold, high paramos of southern Colombia and northern Ecuador. The plants grow epiphytically in patches of humid forest, but more frequently on the steep, sheltered, gravelly embankments of streams and road-cuts. Sometimes neither shrub nor tree exists near this habitat. The largest plants in the area are the woolly fralejones (large species of the Compositae) which blanket much of the terrain in extensive forest-like groves. Sterile or fruiting similar plants of *Brachionidium*, presumably of this species, are found frequently in comparable habitats in this area.

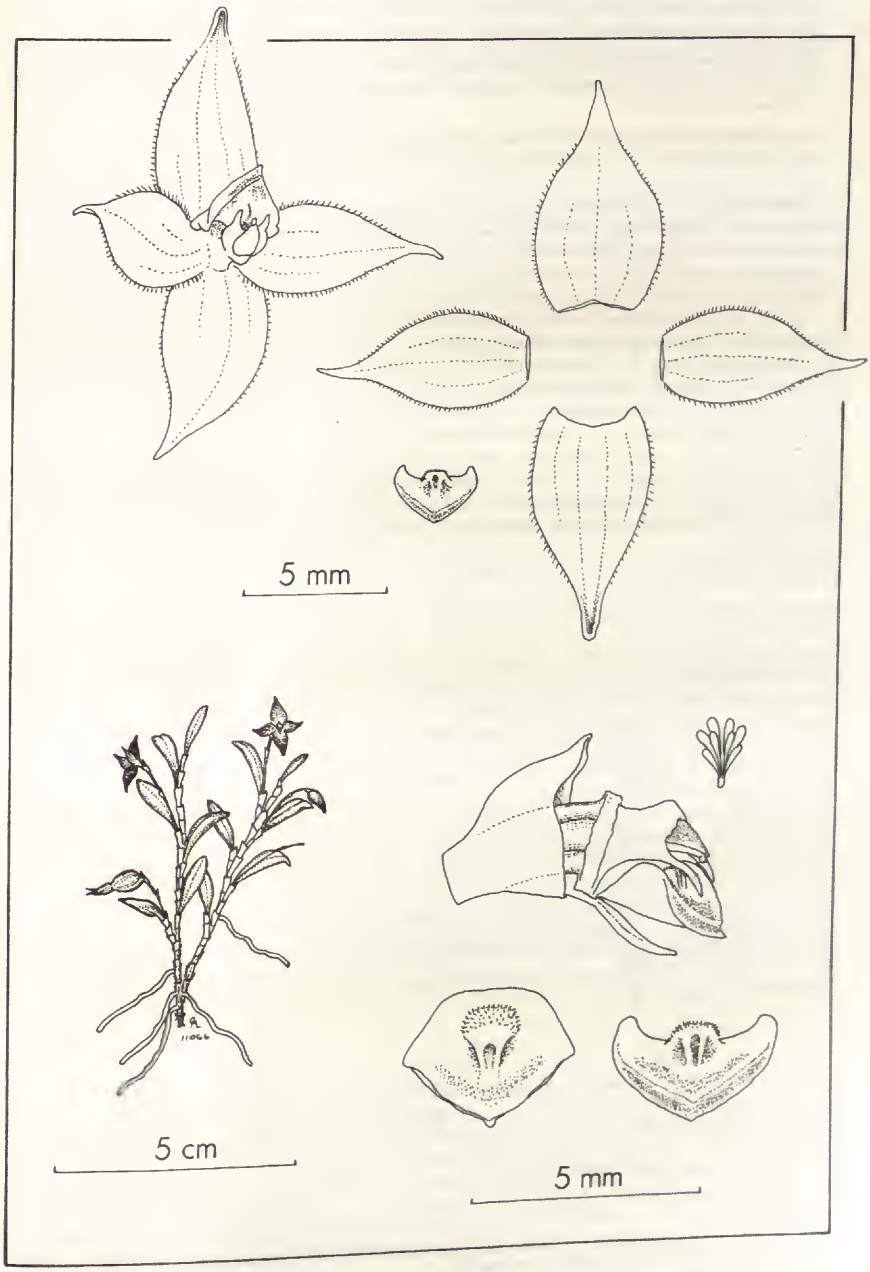


Plate 57. *Brachionidium tetrapetalum* (Lehm. & Kränzl.) Schltr.

Brachionidium tuberculatum Lindl., Folia Orchid. *Brachionidium* 1, 1859.

Ety.: From the Latin *tuberculatus*, "tuberculate," referring to the callus of the lip.

Brachionidium concolor Lindl., Folia Orch. *Brachionidium* 1, 1859.

Ety.: From the Latin *concolor*, "of one color," referring to a uniform color of the flower.

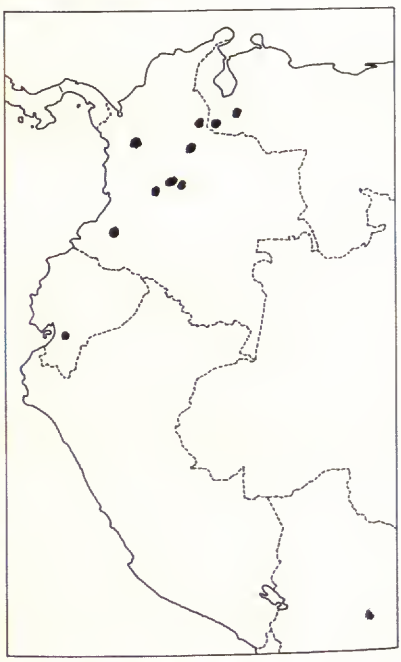
Syn.: *Brachionidium floribundum* Garay, Canad. J. Bot. 34: 736, 1956.

Ety.: From the Latin *florbundus*, "profusely flowering," referring to a somewhat exaggerated character of the plant.

Syn.: *Brachionidium steyermarkii* Foldats, Acta Bot. Venez. 3: 306, 1968.

Ety.: Named in honor of Dr. Julian Steyermark, who with G. C. K. Dunsterville, collected this species.

Plant medium in size, terrestrial in humus, to low-epiphytic, erect, branching, up to 20 cm tall, the rhizomes stout, 3-15 mm long between ramicauls, enclosed by 3 long-mucronate sheaths, tuberculate on the lower margin; roots coarse from nodes near the base. Ramicauls suberect, 3-7 mm long, enclosed by 2 similar, imbricating sheaths. **Leaf** suberect, more or less suffused with purple, coriaceous, prominently veined, broadly elliptical, subacute to obtuse, 8-27 mm long with a petiole 1-2 mm long, 6-17 mm wide, 7- to 11-veined, the base broadly cuneate. **Inflorescence** a solitary, non-resupinate, light to dark purple or yellow flower, borne by an erect peduncle 11-30 mm long, with a bract near the middle and at the base, from near the apex of the ramicaul; floral bract inflated, mucronate, 3-6 mm long; pedicel 0.5-1 mm long, with a filament 4-6 mm long; ovary 1.5-2 mm long; **sepals** sparsely short-ciliate to eciliate, the middle sepal ovate, acute, acuminate, 11-20 mm long, 4-7.5 mm wide, 3-veined, the lateral sepals completely connate into an ovate, acute, acuminate lamina 11-20 mm long, 6-9 mm wide, 4-veined; **petals** shortly ciliate, ovate, oblique, acute, long-acuminate, 11-18 mm long, 4-6 mm wide, 3-veined; **lip** transversely cordate-ovate, 2-2.5 mm long, 3-4 mm wide, the lateral angles curved up, obtuse, the apex broadly rounded with callous margins, shortly apiculate, the disc with a central, flat, elevated, shortly pubescent, ovoid callus with a glenion; **column** stout, 1.5 mm long, pollinia 8.



VENEZUELA: Edo. Mérida: alt. 8000 ft., June 1847, *L. Schlim 1558* (Holotype: K; Isotypes: G, LD, W); between Torondoy and Piñango, alt. 2700 m, 17 Dec. 1948, *J. Renz 5035* (Herb. J. Renz); between El Molino and Canaguá, alt. 2500 m, 6 June 1949, *J. Renz 5441* (Herb. J. Renz); between Tovar and Guaraque, alt. 2400 m, 18 July 1951, *J. Renz 7248* (Herb. J. Renz). Edo Táchira: Páramo de Tamá, alt. 2920 m, 20-23 May 1967, *J. A. Steyermark & G. C. K. & E. Dunsterville 98592* (AMES, NY, VEN, type of *B. steyermarkii*), G.C.K. Dunsterville 55.
COLOMBIA: Dept. of Antioquia: "Medellín," *C. Patín 1820* (W); Antioquia, May 1873, *C. Patin s.n.* (K); Munic. of El Retiro, Hda. Normandía, 2-3 Dec. 1956, *M. Ospina Hernandez 79* (AMES, COL); Munic. of Envigado, terrestrial in wet forest above Colomborquídeas, alt. 2500 m, collected by F. (Pacho) Lopez, Aug. 1990, *R. Escobar 4056* (MO), C. Luer illustr. 14351. Dept. of Boyacá: Sierra Nevada del Cocuy, alt. 2900 m, 16 Aug. 1957, *P. J. Grubb, B.A.B. Curry & A. Fernandez-Perez 545* (COL). Dept. of Cauca; Central Andes above Popayán, terrestrial, Páramo del Buey, *F. C. Lehmann s.n.* (K). Dept. of Cundinamarca: Quebritas, road between Jaji and Gonzalestal, alt. 2700 m, 28 Apr. 1949, *J. Renz 5253* (AMES, Herb. J. Renz, type of *B. floribundum*); North of San Miguel, alt. 2000 m, 9 Feb. 1941, *J. Renz 3843* (AMES; (Herb. J. Renz); between Une and Gutierrez, between Rio Saname and Taquete, alt. 2900 m, 8 July 1955, *J. Renz 8457* (Herb. J. Renz); north of San Miguel, alt. 2800 m, 9 Feb. 1944, *J. Renz 3843* (Herb. J. Renz); San Miguel near Sibaté, terrestrial, alt. 2800-2900 m, 11 Nov. 1953, *M. Schneider 444* (S); Munic. San Bernardo, Cuchilla de Paquiló, alt. 2900 m, 22 July 1981, *R. Jaramillo, A. M. Cleef, O. Rangel & S. Salamanca 6920* (COL); cloud forest above Gutierrez south of Bogotá, alt. 2850 m, 19 May 1984, *C. Luer, J. Luer & R. Escobar 10384* (MO); Munic. Junín, Reserva Carpanta alt. 2500-3300 m, 27 Apr. 1988, *J. L.*

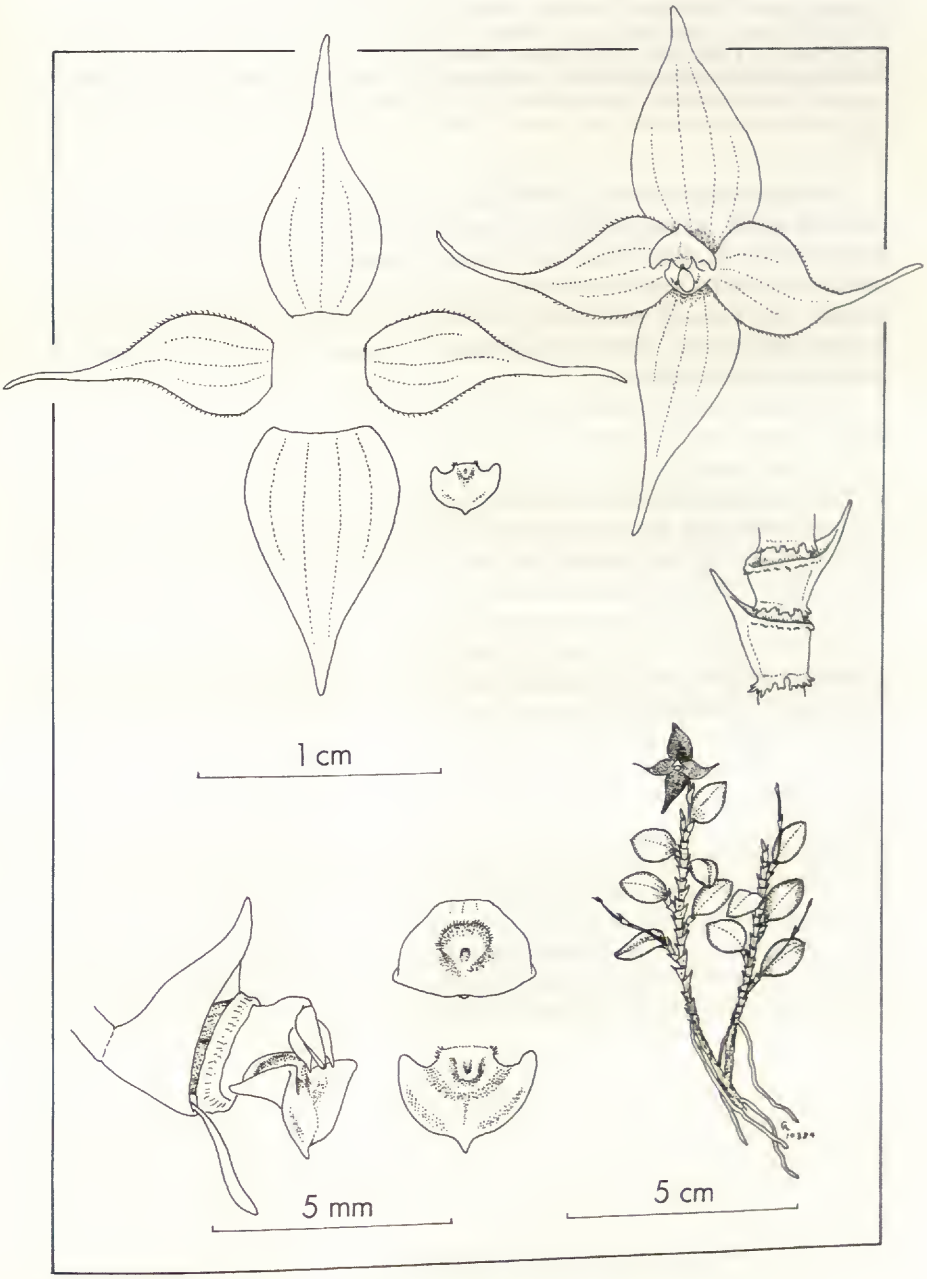


Plate 58. *Brachionidium tuberculatum* Lindl.

Luteyn, O. Rangel & J. Aguirre 12223 (COL, NY). Dept. of Santander: páramo east of Bucaramanga toward Berlin, alt. 2950 m, 7 May 1984, *C. Luer, J. Luer, R. Escobar & E. Valencia 10170* (MO). Dept. of Tolima: between Manizales and Fresno, alt. 3200 m, 6 Apr. 1956, *J. Renz 8619* (Herb. J. Renz).
ECUADOR: Prov. of Azuay: moist, forested slopes bordering Río Collay south of El Pan, alt. 2650-3290 m, 6 July 1943, *J. A. Steyermark 53360* (F), specimen sterile.
BOLIVIA: without locality, 1846, *Bridges s.n.* (Holotype: K). Dept. of Cochabamba: Prov. of Chapare, terrestrial in forest northeast of Cochabamba, alt. 1900 m, 29 Jan. 1984, *C. Luer, J. Luer & R. Vásquez 9476* (SEL); same area, 18 Jan. 1988, *C. Luer, J. Luer, R. Vásquez, T. & D. Mulder & A. Vogel 12867* (MO).

The epithet *tuberculatum* is misleading. There is indeed a thick callus in the center of the lip, and to Lindley it seemed tuberculate in a rehydrated or poorly preserved flower. The locality and vegetative appearance of the plant and the sketch of the flower leave no doubt that it is a well-known, frequent and somewhat variable species found in all three cordilleras of Colombia, adjacent Venezuela, Ecuador and Bolivia. Specimens of Schlim's original collection are present in several European herbaria.

This species was first collected in Bolivia by Bridges a century and a half ago, and it had not been collected there again until 1984. Lindley described it as *B. concolor* simultaneously with *B. tuberculatum*, but the later is chosen for the name because it is widely known in a wide distribution.

A specimen from western Venezuela was redescribed by Garay as *B. floribundum*, and he applied the epithet *tuberculatum* to *B. tetrapetalum* (Garay, 1956), which is also relatively common but restricted to the high paramo and subparamo forests of southern Colombia and northern Ecuador.

Brachionidium tuberculatum is characterized by a stout rhizome that usually grows more or less erect terrestrially in the leafy humus of wet cloud forests. The rhizome is enclosed by a series of mucronate sheaths that are more or less tuberculate or fimbriate on their lower margins. Old plants seem to cease growing in height and leaves become lost or degenerate so that herbarium specimens vary in appearance. Specimens of young, actively growing plants retain more and fresher leaves.

The solitary, purple flower with acuminate sepals and petals is held just above a leaf. The petals are microscopically but densely ciliate. The broadly cordate lip is furnished with an elevated but flat, minutely pubescent callus channeled on the front surface into a glenion. Freshly pickled flowers from several, distant localities have been examined. Plate 58. is an illustration of a collection from Colombia, and Plate 59. is an illustration of a collection from Bolivia.

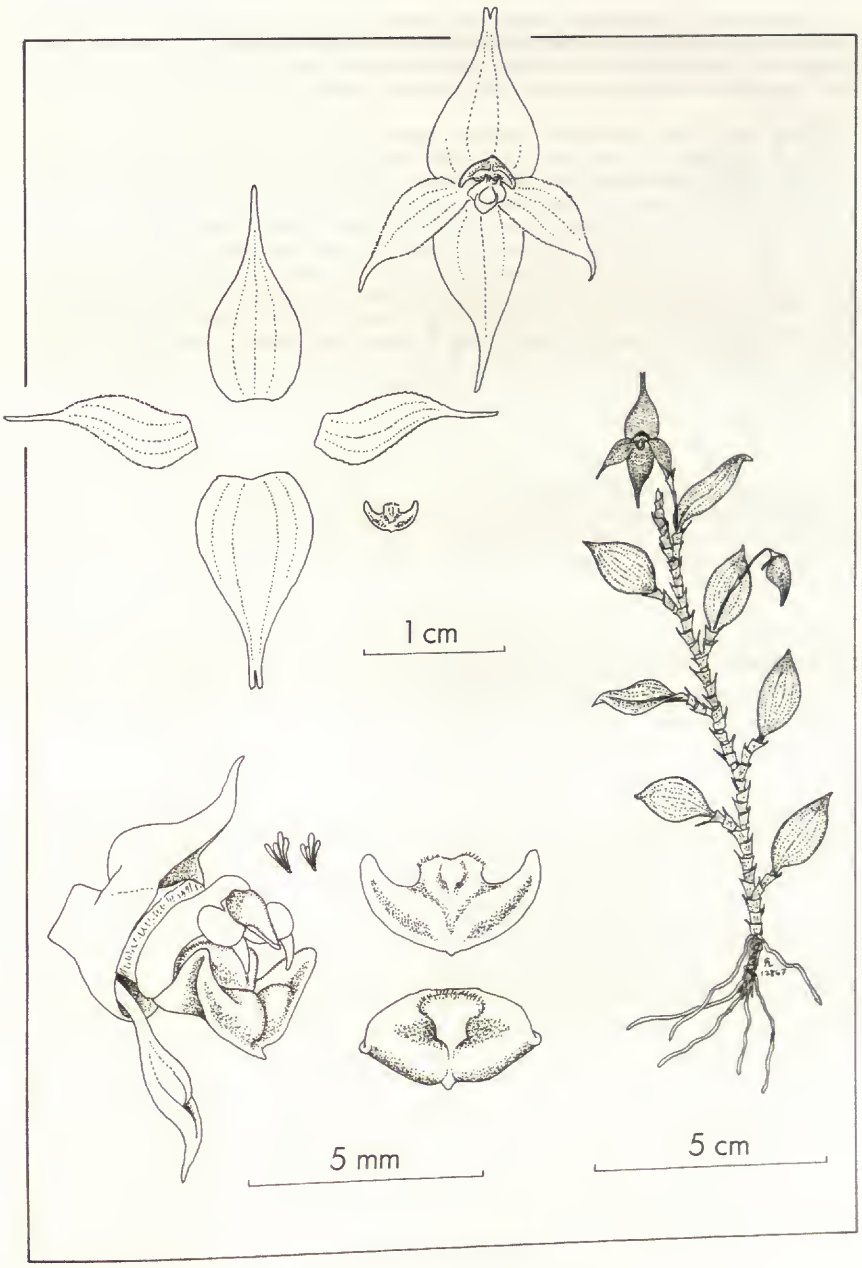


Plate 59. *Brachionidium tuberculatum* Lindl.

Brachionidium uxorium Luer & Vásquez, sp. nov.

Ety.: From the Latin *uxorius*, "of the wife," in honor of Jane P. Luer who discovered this species.

Planta mediocris erecta rhizomate crasso vaginis scabrissimis, foliis ellipticis 5- ad 7-nervatis, flore mediocris, sepalis petalisque albis rubro striatis ciliatis, sepalo mediano synsepaloque ovatis acutis leviter acuminatis, petalis similibus ovatis obliquis, labello transverse obovoideo, lobis lateralibus acutis, apice obtuso apiculato, disco incrassatis cum callo pubescenti supra basem.

Plant medium in size, terrestrial in loose humus, erect, up to 18 cm or more tall, the rhizome stout, occasionally branching, 10-15 mm long between ramicauls, enclosed by 3 tubular, mucronate sheaths with shaggy, cellular, appendages; roots coarse from near the base. Ramicauls stout, suberect, 3-5 mm long, enclosed by 2 mucronate sheaths. **Leaf** erect or suberect, coriaceous, elliptical, acute, 15-23 mm long including a petiole 2-4 mm long, 6-9 mm wide, 5- to 7-veined. **Inflorescence** a solitary, non-resupinate flower borne by a slender, erect peduncle 10-20 mm long, with a mucronate bract near the middle, from near the apex of the ramicaul; floral bract inflated, acute, mucronate, 3-4 mm long, enclosing the pedicel and the ovary; pedicel stout, 0.5 mm long, with a filament 4 mm long; ovary 2 mm long; **sepals** white with prominent, red-purple stripes along the veins, shortly ciliate, the middle sepal ovate, acute, lightly acuminate, 14 mm long, 6 mm wide, 3-veined, the lateral sepals completely connate into an ovate, subacute, lightly acuminate synsepal, 14 mm long, 8.5 mm wide, 4-veined; **petals** ovate, oblique, acute, acuminate, ciliate, 13 mm long, 4 mm wide, 3-veined; **lip** yellow-orange, transversely obovoid, 2 mm long, 3.5 mm wide, the lateral angles acute, the apex obtuse, shortly apiculate, the disc thickened above the entire margins, with a rounded, elevated but flat, pubescent callus above the base, the base thin, broadly cuneate-unguiculate, hinged to the column-foot; **column** stout, 1 mm long, 2 mm wide; pollinia 8.

BOLIVIA: Dept. of Cochabamba: Chapare, northeast of Cochabamba toward Villa Tunari, terrestrial in deep humus in wet forest, alt. 2800 m, 14 Nov. 1992, *C. Luer, J. Luer, R. Vásquez, D. Ric & W. Teague 16416* (Holotype: MO).

This distinctive, showy species is known from a single discovery by Jane Luer. Several plants were growing at the mossy base of a large, ancient tree on the north slope of central Bolivia where it is presumably endemic. See Frontispiece. At that time of its discovery, this orchid-rich forest was in the process of being destroyed for fire-wood by local people.

Vegetatively this species appears similar to the widely distributed *B. tuberculatum*. The colors of the flowers are unique in the genus: white with prominently red-striped sepals and petals and a butterscotch-colored lip. The sepals are slightly acuminate, not caudate; the petals are acute and shortly caudate. The lip is transverse with acute, lateral angles.

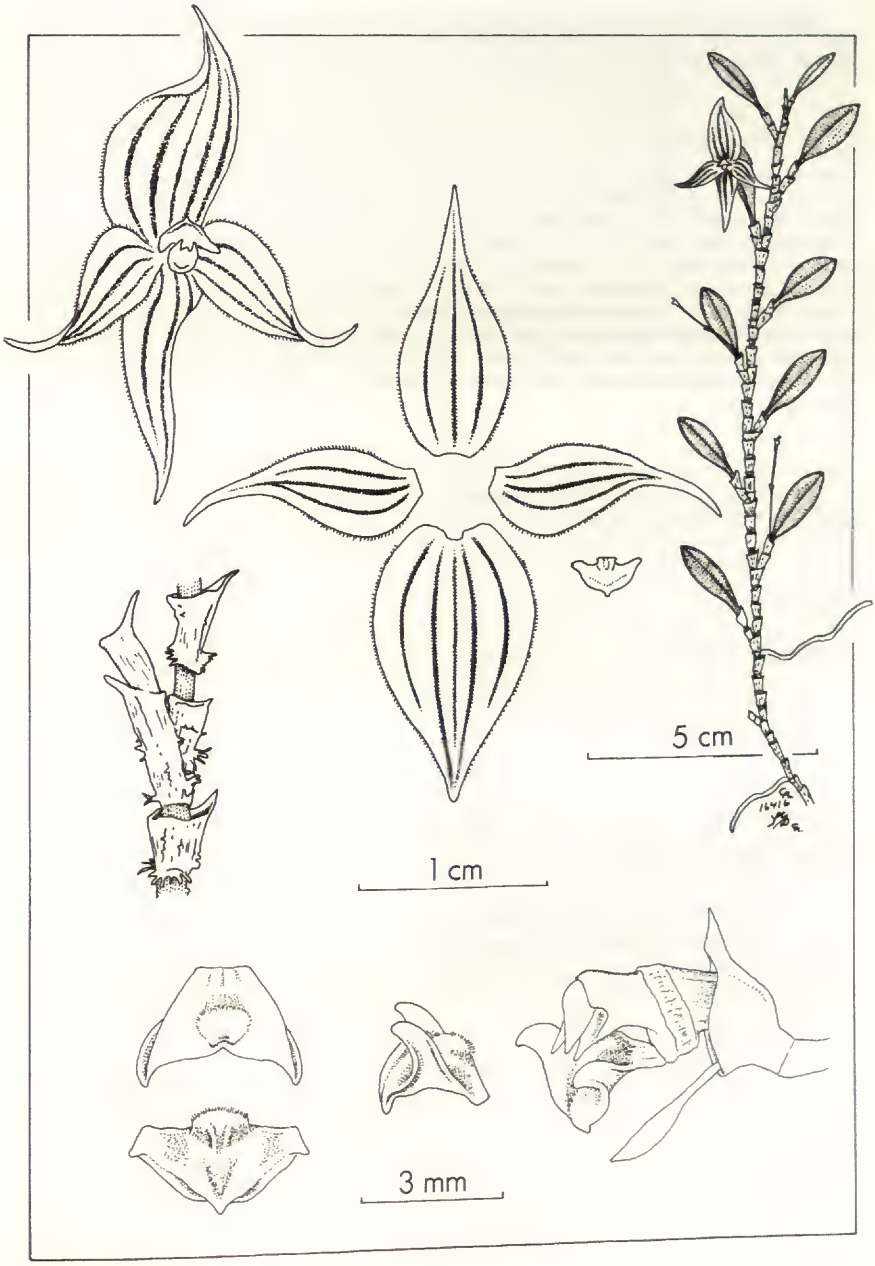


Plate 60. *Brachionidium uxorium* Luer & Vásquez

Brachionidium valerioi Ames & Schweinf., Sched. Orchid. 10: 53, 1930.

Ety.: Named in honor of Juvenal Valerio, co-discoverer of this species.

Plant small but forming large mats, epiphytic, the rhizome slender, long-repent, occasionally branching, up to 20 cm long, 4-12 mm long between ramicauls, with 3 imbricating, mucronate, tubular sheaths; roots slender, from nodes along the rhizome. Ramicauls erect to suberect, 4-7 mm long, enclosed by 2 similar sheaths. **Leaf** erect to suberect, coriaceous, elliptical, acute, apiculate, 15-20 mm long including the petiole 1-2 mm long, 5-7 mm wide, 7-veined, the base cuneate into the petiole. **Inflorescence** a single, non-resupinate flower borne by a slender peduncle 15-18 mm long, with a bract near the middle, from near the apex of the ramicaul; floral bract infundibular, acuminate, mucronate, 3 mm long, enclosing the pedicel and ovary; pedicel thick, 0.5 mm long, with a protruding filament 3 mm long; ovary stout, 1.5 mm long; **sepals** translucent pale green, the middle sepal elliptical, the blade 5 mm long, 3 mm wide, 3-veined, the apex acute, long-acuminate into a filiform tail ca. 15 cm long, the lateral sepals connate into a ovate, deeply concave synsepal, 5 mm long, 5 mm wide expanded, 4-veined, the apex acute, acuminate into a tail ca. 15 mm long, bifid above the middle; **petals** translucent pale green, minutely ciliate, ovate, oblique, the blade 5 mm long, 3 mm wide, 3-veined, the apex acute, acuminate into a filiform tail ca. 15 mm long; **lip** transversely subtrapeziform, 2 mm long, 3 mm wide, the lateral angles acute, the apex broadly rounded, prominently apiculate, the margins coarsely denticulate-erose, with a submarginal crested callus, with minute crystalline substance within the lip, the disc with a central, flat, ovoid, minutely pubescent callus shallowly cleft anteriorly; **column** stout, 0.5 mm long, 1 mm broad; pollinia 6.

COSTA RICA: Prov. of Heredia: Cerros de Zurquí northeast of San Isídro, alt. 2000-2400 m, 8 Mar. 1926, *P. C. Standley & J. Valerio 50759* (Holotype: AMES; Isotype: US), C. Luer illustr. 14465; Cerro Zurquí, alt. 2000 m, 13 Mar. 1979, *C. Todzia 563* (CR); Yerba Buena, northeast of San Isidro, alt. 2000 m, 22-28 Feb. 1926, *P. C. Standley & J. Valerio 50136* (AMES, US); Cerro de las Caricias north of San Isídro, 11 Mar. 1926, *P. C. Standley & J. Valerio 52366, 52419* (AMES, US).

This species is apparently confined locally in the province of Heredia in central Costa Rica where it has been found on few occasions. It is a weak, long-repent species with a slender rhizome and little, elliptical leaves. Large, loose mats may accumulate. The sepals and petals of the small flowers are long-caudate. The very distinctive lip is coarsely fringed with an additional fringed callus lying behind the margin of the lip.

The illustration published by Garay (1956) for *B. valerioi* is *B. folsomii* which was undescribed at that time. The illustration was copied from a drawing made by Endres in Costa Rica in the nineteenth century. Garay did not include an illustration of *B. valerioi*.

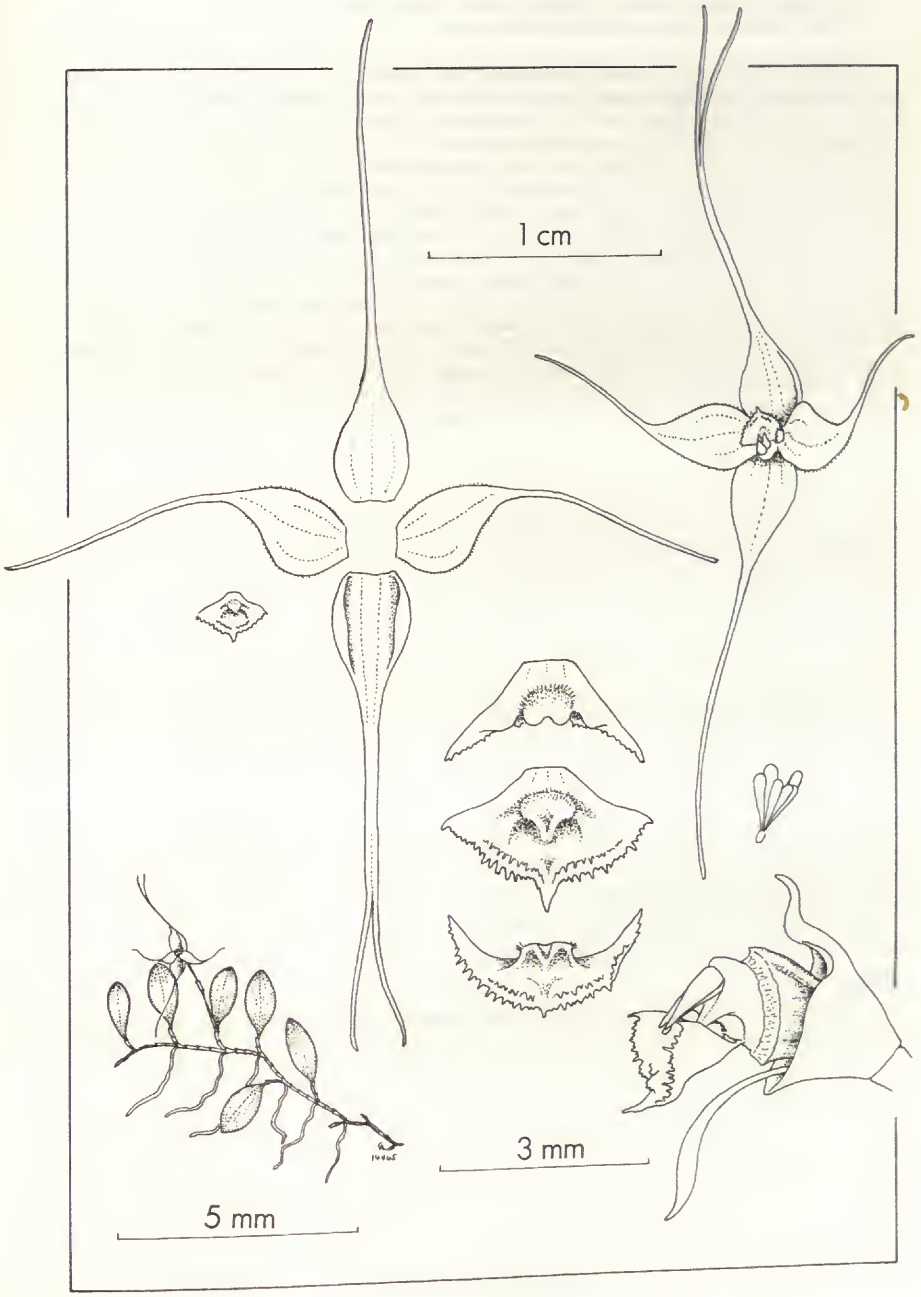


Plate 61. *Brachionidium valerioi* Ames & Schweinf.

Brachionidium vasquezii Luer, Phytologia 55: 177, 1984.

Ety.: Named in honor of Roberto Vásquez Chavez of Cochabamba, Bolivia, illustrator and co-author of the *Orchids of Bolivia*, who discovered this species.

Plant medium in size, terrestrial, the rhizome erect, branching, up to 25 cm tall, 5-20 mm long between ramicauls, with 3 imbricating, tubular sheaths; roots slender, fasciculate, from the base. Ramicauls erect, 10-17 mm long, enclosed by 2 similar sheaths. **Leaf** erect, coriaceous, elliptical, acute, apiculate, denticulate, 15-25 mm long including the petiole 1-3 mm long, 5-8 mm wide, 7-veined, the base cuneate into the petiole. **Inflorescence** a single, non-resupinate flower borne by a slender peduncle 5-15 cm long, with a bract near the middle and another near the base, from near the apex of the ramicaul; floral bract infundibular, acute, 5 mm long, enclosing the pedicel and ovary; pedicel thick, 1 mm long, with a protruding filament 5 mm long; ovary stout, 2.5 mm long; **sepals** translucent rose, veined in purple, eciliate, the middle sepal broadly ovate, 15 mm long, 9 mm wide, 3-veined, the apex obtuse, acuminate into a short tail ca. 2 mm long, the lateral sepals completely connate into a broadly ovate lamina, 13 mm long, 9 mm wide, 4-veined, the apex obtuse, acuminate into a short tail ca. 2 mm long; **petals** translucent rose, veined in purple, shortly ciliate, broadly ovate, oblique, 13 mm long, 7 mm wide, 3-veined, the apex obtuse, acuminate into a slender tail ca. 2 mm long; **lip** thick, transversely oblong-ovate, concave, viewed from the top, transversely cordate viewed from in front, 2.5 mm long, 5 mm wide, the lateral angles obtuse, incurved, the apex broadly rounded, apiculate, marginally callous with the margin flattened, the disc with a central, ovoid, minutely pubescent callus with a glenion; **column** stout, 1.5 mm long; pollinia 8.

BOLIVIA: Dept. of Cochabamba: Prov. of Chapare, Balconcillo, terrestrial in moss along the trail, alt. 3250 m, 7 Dec. 1980, *R. Vásquez 477* (Holotype: SEL; Isotype: Herb. Vásquezianum); same area, 17 Jan. 1984, *C. Luer, J. Luer & R. Vásquez 9356* (SEL); 18 Nov. 1984, *C. Luer, J. Luer & R. Vásquez 10493* (MO). Dept. of La Paz: Prov. of Nor Yungas, terrestrial northwest of Chuspipata, alt. 3100 m, 26 Aug. 1983, *J. C. Solomon 10663* (LPB, MO).

Brachionidium vasquezii was first discovered by Roberto Vásquez in 1980. It grows terrestrially at high altitudes over 3000 meters above sea level on the northern slopes of the Andes of Bolivia. Erect rhizomes stand in wet, mossy habitats with the showy, purple-striped flower held high by an exceedingly long peduncle, which is unknown in any other member of the genus.

The sepals and petals are broadly ovate, obtuse and acuminate into slender tails considerably shorter than the blades. Only the sepals are minutely ciliate. The lip is transversely ovate and concave with a flattened margin. The relatively small callus is elevated with an anterior glenion.

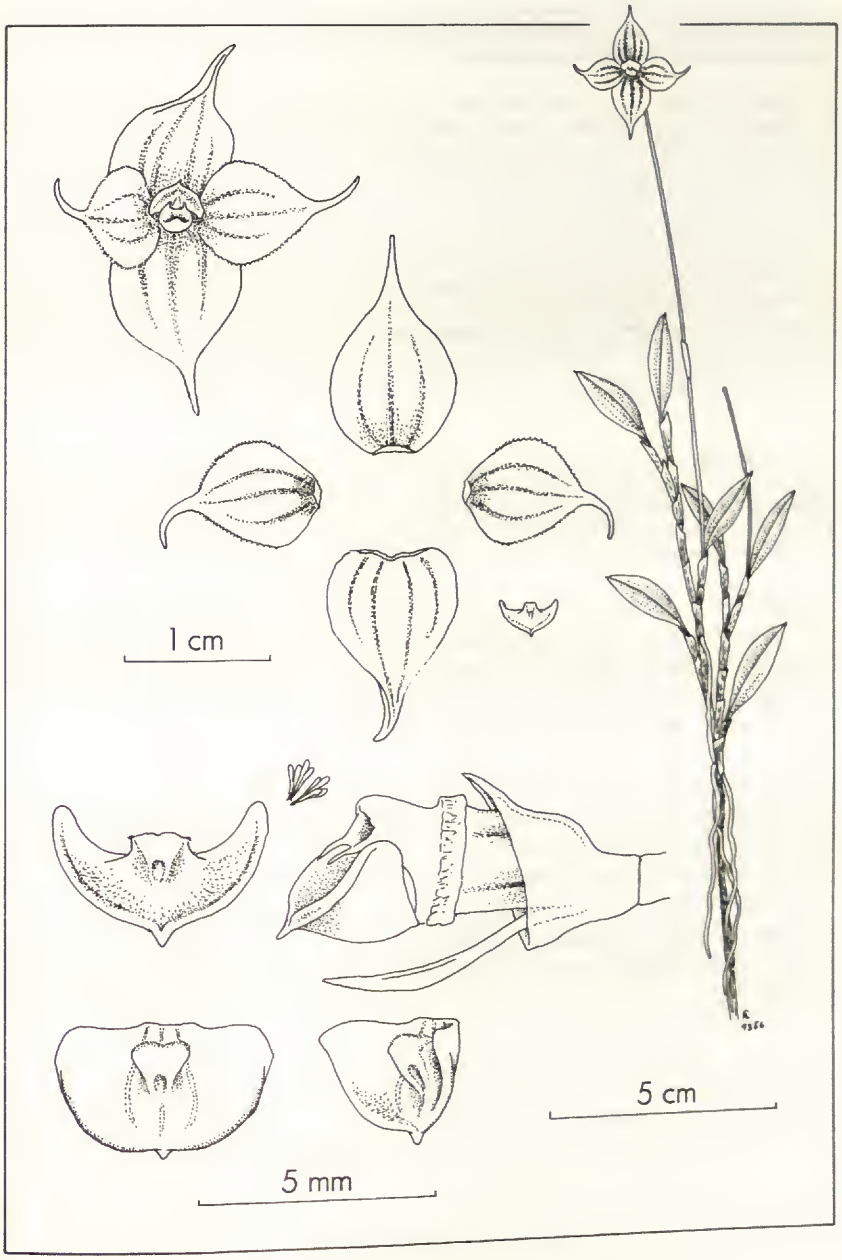


Plate 62. *Brachionidium vasquezii* Luer

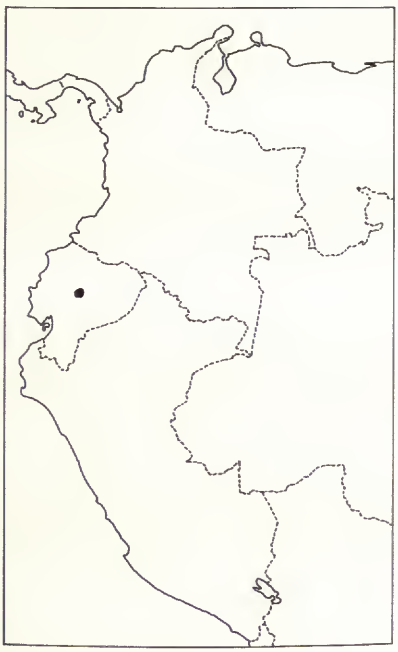
Brachionidium zunagense Luer & Hirtz, sp. nov.

Ety.: Named for the region around Río Zuñag where this species was discovered.

Planta parva repens, foliis late ovatis, sepalo mediano minute ciliato ovato longi-acuminato, synsepalo minore triangulari longi-acuminato, petalis minute ciliatis obliquis longi-acuminatis, labello crasso transverse triangulari cum callo centrali pubescenti.

Plant small, epiphytic, prostrate, long-repent, 10-15 cm long, the rhizome slender, occasionally branching, 5-6 mm long between ramicauls, enclosed by 3 imbricating, long-mucronate sheaths; roots slender, produced singly from nodes. Ramicauls suberect, 1-1.5 mm long, enclosed by 2 similar sheaths. **Leaf** suberect to spreading, coriaceous, broadly elliptical-ovate, 8-10 mm long, 6-7 mm wide, 5-veined, the apex obtuse, apiculate, the rounded base contracted into a petiole 0.5 mm long. **Inflorescence** a single, non-resupinate, transparent, yellow flower borne by a slender, erect peduncle 11-15 mm long, with a long-acuminate bract near the middle; floral bract inflated, long-acuminate, 1.5 mm long enclosing the pedicel and ovary; pedicel 0.3 mm long, with a filament 1.5 mm long; **sepals** translucent yellow, the middle sepal ciliate, ovate, acute, long-acuminate, 8 mm long including the tail,2 mm wide, 3-veined, the lateral sepals eciliate, completely connate into a triangular, acute, long-acuminate blade 7 mm long, 1.5 mm wide, 2-veined; **petals** colored as the sepals, ciliate, narrowly falcate-ovate, oblique, acute, long-acuminate, 7 mm long including the tail, 1.5 mm wide, 1-veined; **lip** yellow, brown centrally, thick, transversely triangular, 1.2 mm long, 2 mm wide expanded, the lateral angles obtuse, the apex obtuse, minutely apiculate, the margins thick, cellular-pubescent, the disc with a pubescent callus; **column** stout, 0.75 mm long; pollinia 6.

ECUADOR: Prov. of Pastaza: creeping in humus in cloud forest along Río Zuñag, alt. 1900 m, 23 Feb. 1990, *A. Hirtz, S. Dalström, L. Åmby, J. del Hierro, E. Astorga, S. Ortega & J. Cabezas 4638* (Holotype: MO), C. Luer illustr. 14716.



This small, repent species was found growing in loose humus in a remote, inaccessible forest of eastern, central Ecuador. It is characterized by the small, broadly ovate, apiculate leaves, and small yellowish flowers with long-attenuate sepals and petals. The uppermost middle sepal is larger than the synsepal. The petals are falcate in the natural position. The lip is transversely triangular and obtuse with thick, cellular-pubescent margins, unique in the genus. The central callus is well-defined but relatively small and pubescent.

The creeping habit is very similar to that of *B. polypodium*, but the flowers differ in many ways, most obviously in the pubescent lip of *B. zunagense*.

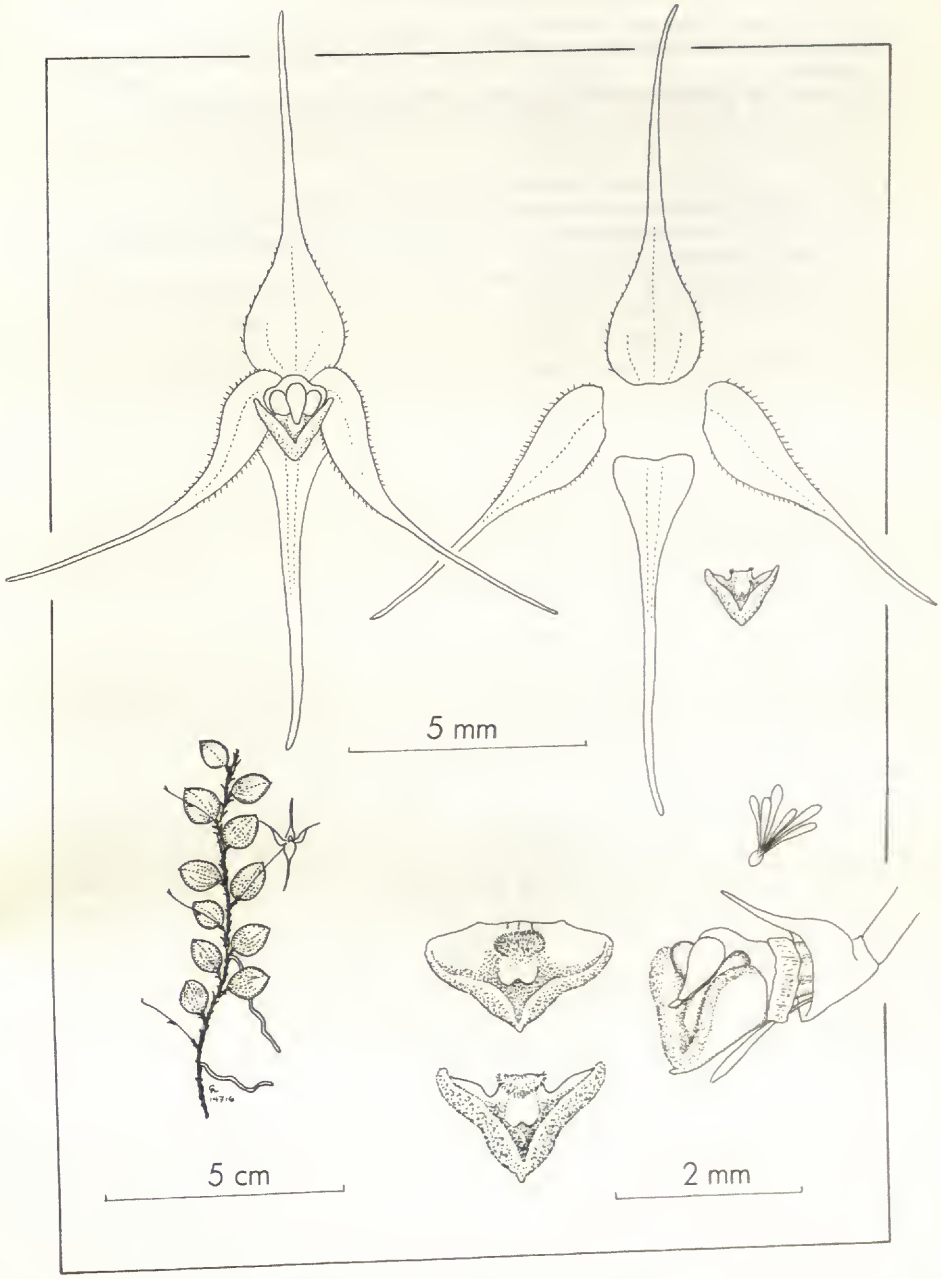


Plate 63. *Brachionidium zunagense* Luer & Hirtz

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ADDENDA TO DRESSLERELLA, PLATYSTELE AND PORROGLOSSUM

ABSTRACT

The following new species of *Dresslerella* Luer, *Platystele* Schltr. and *Porroglossum* Schltr. have been discovered since the most recent additions to the genera in *Icones Pleurothallidinarum*. The plates are numbered as continuations of their respective appearances in *Icones*.

New Taxa:
Dresslerella archilae Luer & Behar, sp. nov.
Platystele bovilinguis Luer, sp. nov.
Porroglossum josei Luer, sp. nov.

Dresslerella archilae Luer & Behar, sp. nov.

Ety.: Named in honor of Fredy Archila of Cobán, Guatemala, who discovered this species.

Inter species generis *Dresslerellae* Luer planta parva, folio ovato longipubescenti, ovario sepalisque etiam longipubescentibus, sepalo dorsali ovato acuto liberi, synsepalo saccato, petalis glabris oblique obovatis, labello oblongo, supra medium verruculoso subtruncato, infra medium angustiore cum lobis tenuibus uncinatis, columna bidentata, pollinia quattuor consimilibus.

Plant small, epiphytic, caespitose; roots slender. Ramicauls prostrate, slender, 22-25 mm long, enclosed by 3 loose, tubular sheaths. **Leaf** horizontal, coriaceous, long-pubescent, ovate, acute, sessile, 25-30 mm long, 8-11 mm wide. **Inflorescence** a succession of single flowers produced from the base of the leaf; peduncles ascending, 2 mm long; floral bracts tubular, pubescent, 2 mm long; pedicels 2 mm long; ovary densely long-pubescent, 1.5 mm long; **sepals** fleshy, long-pubescent, greenish, heavily marked with dark purple, the dorsal sepal ovate, acute, 4.5 mm long, 2 mm wide, 3-veined, free from the laterals, the lateral sepals connate into a deeply concave, obovoid synsepal, inflated above the middle with the obtuse apex incurved, 5.5 mm long, 4 mm wide unexpanded; **petals** red-purple, glabrous, obovate, oblique, dilated on the labellar margin above the middle, acute, 3.5 mm long, 1.6 mm wide; **lip** red-purple, oblong-obovate-trilobed, broadly subtruncate, verrucose above the middle with erose margins, smooth and narrowed below the middle, the margins erect with a pair of obtuse, uncinate, antrorse lobes, the disc bicallous from the bases of the lobes to the middle, the base thick, immobily attached to the column-foot; **column** yellow, slender, bidentate at the apex, 2.5 mm long, the foot thick, 1 mm long; pollinia 4, pyriform, equal-sized.

GUATEMALA: Prov. of Alta Verapaz, without specific locality, collected by Fredy Archila, 1995, flowered in cu;tivation by Moises Behar at Mixto, Guatemala, Sept. 1995, *C. Luer 17754* (Holotype: MO).

This little species is distinguished by the ovate, long-pubescent leaves; a small, purplish, long-pubescent flower with the dorsal sepal free from a deeply saccate synsepal; and by short peduncles. The petals are obliquely obovate. The lip is oblong, verrucose above the middle, and with a pair of small, uncinate lobes below the middle. The four equal-sized pollinia vary from the usual unequal pairs seen in other members of the genus.

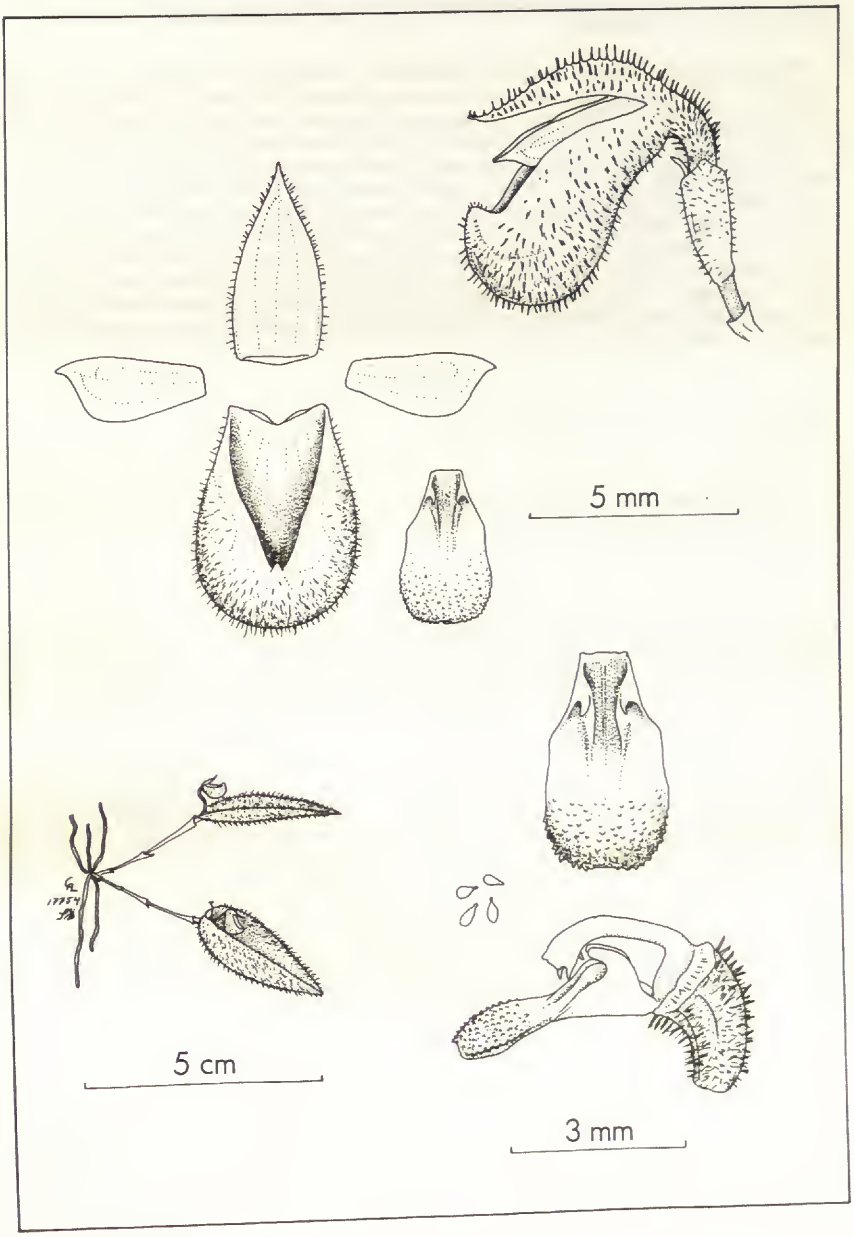


Plate 9. *Dresslerella archilae* Luer & Behar

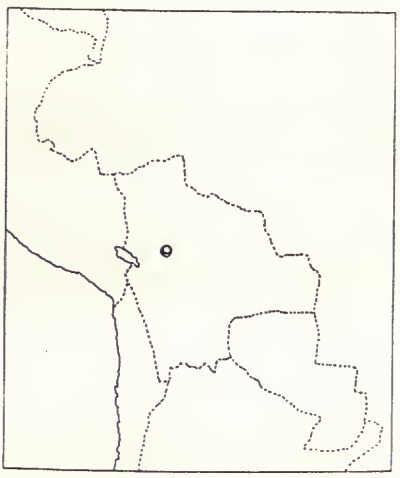
Platystele bovilinguis Luer, sp. nov.

Ety.: From the Latin *bovilinguis*, "like a cow's tongue," in allusion to the labellum.

Inter species generis *Platysteles* Schltr. planta parvula, racemo congesto longipedicellato folio anguste obovato breviore, sepalis ovatis obtusis, petalis ellipticis acutis, labello cymbiformi incurvo cum apice infra clinandrio grandi inflato.

Plant very small, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 5-6 mm long, enclosed by 2 thin, tubular sheaths. **Leaf** erect, coriaceous, petiolate, 15-18 mm long including a petiole ca. 3 mm long, the blade narrowly obovate, subacute to obtuse, 4 mm wide, narrowly cuneate below into the petiole. **Inflorescence** a congested, successively several-flowered raceme, up to 2 mm long, borne by a slender peduncle 4-6 mm long, emerging laterally from the ramicaul; floral bracts thin, 1 mm long; pedicels 2-2.5 mm long; ovary 0.75 mm long; **sepals** translucent pale yellow, glabrous, the dorsal sepal broadly elliptical, concave, with the apex rounded, apiculate, 1.5 mm long, 1 mm wide, 1-veined, the lateral sepals ovate, oblique, subacute to obtuse, shortly acuminate, 1 mm long, 0.75 mm wide, connate about 0.25 mm; **petals** pale yellow, membranous, elliptical, acute, 1 mm long, 0.4 mm wide; **lip** heavily suffused and marked with black, minutely ciliate, pubescent toward the base, obovate, concave, obtuse, with the apical half incurved, 1 mm long, 0.5 mm wide, the base truncate with basal lobes to either side of a small glenion, firmly hinged to the rudimentary column-foot; **column** inflated, cucullate, 0.5 mm long, 0.5 mm wide, the foot rudimentary.

BOLIVIA: Without locality, collected in August 1992 without flowers by Walter Teague, flowered in cultivation by Moises Behar at Mixto, Guatemala, Dec. 1994, *C. Luer 17328* (Holotype: MO).



This little species is distinguished by the tiny brush-shaped raceme, short and congested with long pedicels, that is borne be a short peduncle, about no higher than the petiole of the leaf. The dorsal sepal is concave, with the apex rounded and apiculate. The laterals are ovate and spreading, and the petals are elliptical and acute. Most distinguishing is the black, boat-shaped lip that curves up into the broadly dilated column above, much as a cow's tongue seeks the nares above.

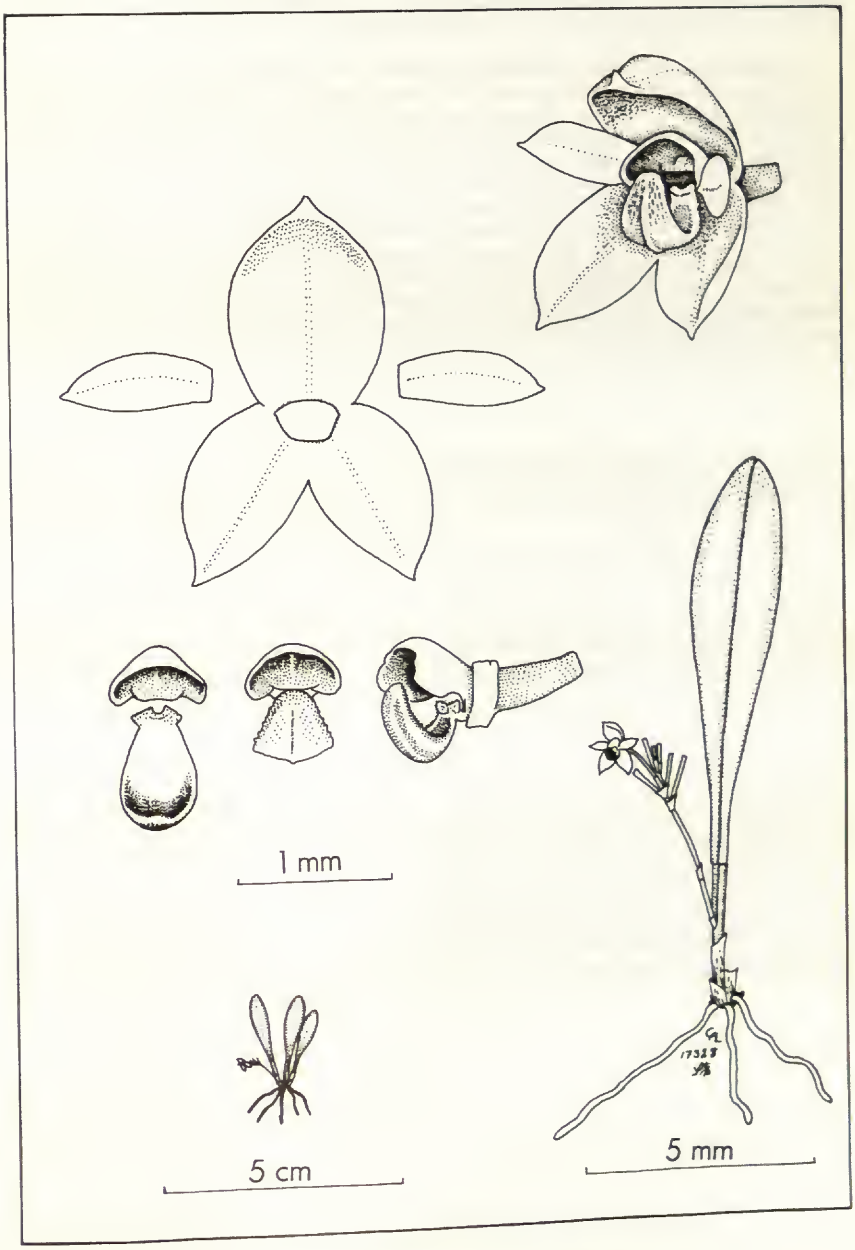


Plate 90. *Platystele bovilinguis* Luer

Porroglossum josei Luer, sp. nov.

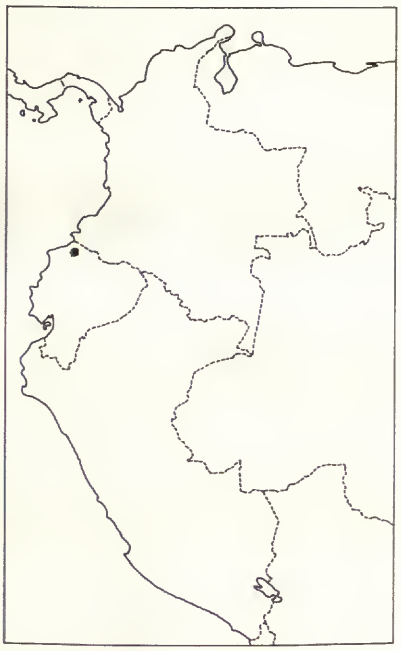
Ety.: Named in honor of José Portilla of Cuenca, Ecuador, who discovered this species.

Inter species generis *Porroglosso* Schltr. planta mediocris, folio elliptico petiolato verrucoso, ovario nontorto, sepalis roseis, sepalo dorsali grandi transverse ovato obtuso brevissime caudato, synsepalo ovato concavo bicaudato, petalis supra basim angulatis, labelli lamina obovato callo humili.

Plant medium in size for the genus, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 7-10 mm long, enclosed by 2-3 tubular sheaths. Leaf erect, coriaceous, verrucose, petiolate, 2-4 cm long including the petiole 1.5 long, the blade elliptical, obtuse, 1.2-1.5 cm wide, cuneate below into the petiole. Inflorescence a congested, successively few-flowered raceme, borne by a slender, glabrous peduncle 8-10 cm long, with a few widely spaced bracts, from low on the ramicaul; floral bracts tubular, 7 mm long; pedicel 8-9 mm long; ovary not twisted, 4-5 mm long; sepals rose, glabrous, the dorsal sepal transversely ovate, 8 mm long, 17 mm wide, connate to the lateral sepals for 3 mm to form a gaping cup, the apex transverse, abruptly contracted into a tail 1.5 mm long, the lateral sepals ovate, oblique, 7 mm long, 4 mm wide, connate 4 mm to form a concave synsepal with an acute mentum below the column-foot, the apices acute, approxinate, contracted into relatively thick, recurved, rose tails, 14 mm long; petals pale rose, ovate, 5 mm long, 1-2.5 mm wide, narrowed to the slightly dilated, rounded apex, the margins acutely angled below the middle; lip rose, suffused with dark purple centrally, the blade obovate, slightly concave, 6 mm long, 5 mm wide, thickened toward the base with a low longitudinal callus, the apex rounded, shortly obtusely apiculate with a shallow, midline sulcus, the base deflexed into a slender, straplike claw 3-4 mm long, bent with tension about the free apex of the column-foot; column stout, semiterete, 3 mm long, with a slender, curved foot 6 mm long, the stigma without processes.

ECUADOR: Prov. of Esmeraldas: between Lita and Maldonado, alt. ca. 1000 m, Sept. 1995, *José Portilla s.n.* (Holotype: MO), C. Luer illustr. 17758.

This species has recently been collected in the remaining virgin forest in northwesternmost, lowland Ecuador by José Portilla. It is distinguisked by the large, resupinate, rose-colored flower. Most conspicuous is the very large, transverse, dorsal sepal with a minute tail. The smaller lateral sepals form a concave synsepal with an acute mentum below the column-foot, and terminate with relatively thick, recurved tails. The petals are sharply angled on both margins below the middle, and the apex is subclavate. The blade of the lip is obovate, shallowly concave, and broadly rounded at the apex.



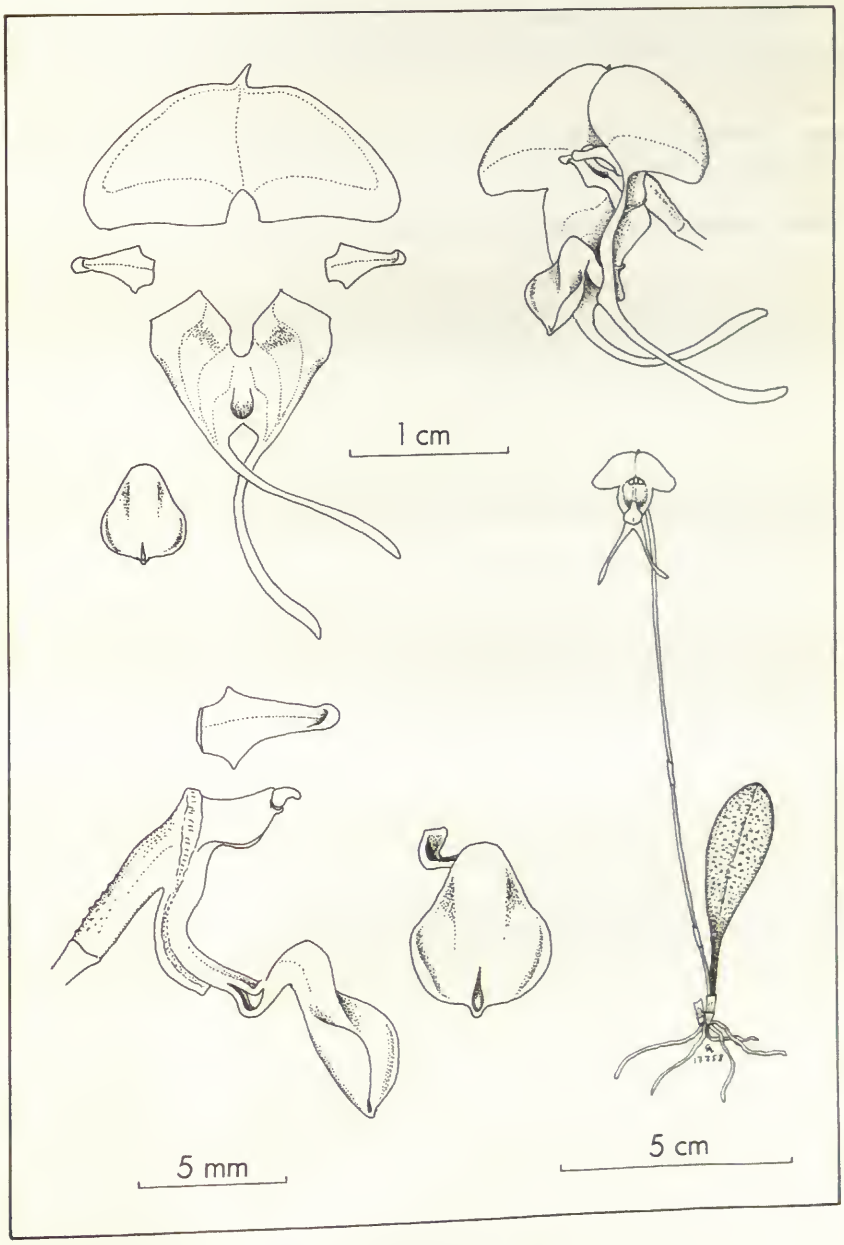


Plate 36. *Porroglossum josei* Luer

A RE-EVALUATION OF THE PLEUROTHALLID SUBGENERA *SATRYIA* AND *SILENIA* (ORCHIDACEAE)

In *Systematics of Myoxanthus* (Luer 1992) two subgenera of *Myoxanthus* Poepp. & Endl. were proposed for seven species that varied significantly from the perimiters that defined the genus. The species of these taxa have greater affinities with *Pleurothallis* R.Br. subgenus *Acianthera* (Scheidw.) Luer (Luer 1986) than they have with *Myoxanthus*. Their transfer to sections of sugbenus *Acianthera* restores the integrity of *Myoxanthus*.

Pleurothallis subgen. **Acianthera** sect. **Satyria** Luer (stat. nov.)

Pleurothallis balaeniceps Luer & Dressler, Orquideología 16: 47. 1986.
Syn.: *Myoxanthus balaeniceps* (Luer & Dressler) Luer, Monogr. Syst. Bot. 44: 94, 1992.
Pleurothallis lappiformis Heller & L.O.Williams, Fieldiana Bot. 31: 42, 1964.
Syn.: *Myoxanthus lappiformis* (Heller & L.O.Williams) Luer, Monogr. Syst. Bot. 44: 96, 1992.
Pleurothallis pan Luer, Selbyana 3: 360, 1976.
Syn.: *Myoxanthus pan* (Luer) Luer, Monogr. Syst. Bot. 44: 98, 1992.
Pleurothallis stonei Luer, Phytologia 44: 171, 1979.
Syn.: *Myoxanthus stonei* (Luer) Luer, Monogr. Syst. Bot. 44: 98, 1992.

Pleurothallis subgen. **Acianthera** sect. **Silenia** Luer (stat. nov.)

Pleurothallis aspasicensis Rchb.f., Bonplandia 3: 75. 1855.
Syn.: *Humboldtia aspasicensis* (Rchb.f.) Kuntze, Rev. Gem. Pl. 2: 667, 1891.
Syn.: *Pleurothallis alexandrae* Schltr., Repert. Spec. Nov. Regni. Veg. Beih. 19: 103, 1923.
Syn.: *Pleurothallis pastensis* Luer, Selbyana 3: 156, 1976.
Syn.: *Myoxanthus aspasicensis* (Rchb.f.) Luer, Monogr. Syst. Bot. 44: 100, 1992.
Pleurothallis sempergemmata Luer, Selbyana 3: 386, 1976.
Syn.: *Myoxanthus sempergemmatus* (Luer) Luer, Monogr. Syst. Bot. 44: 104, 1992.
Pleurothallis uncinata Fawc., J. Bot. 33: 12, 1895.
Syn.: *Myoxanthus uncinatus* (Fawc.) Luer, Monogr. Syst. Bot. 44: 106, 1992.

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LUER, C.A., 1986. Systematics of *Pleurothallis*. Monogr. Syst. Bot. 20: 12.
LUER, C.A., 1992. Systematics of *Myoxanthus*. Monogr. Syst. Bot. 44: 5-6, 94-108.

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